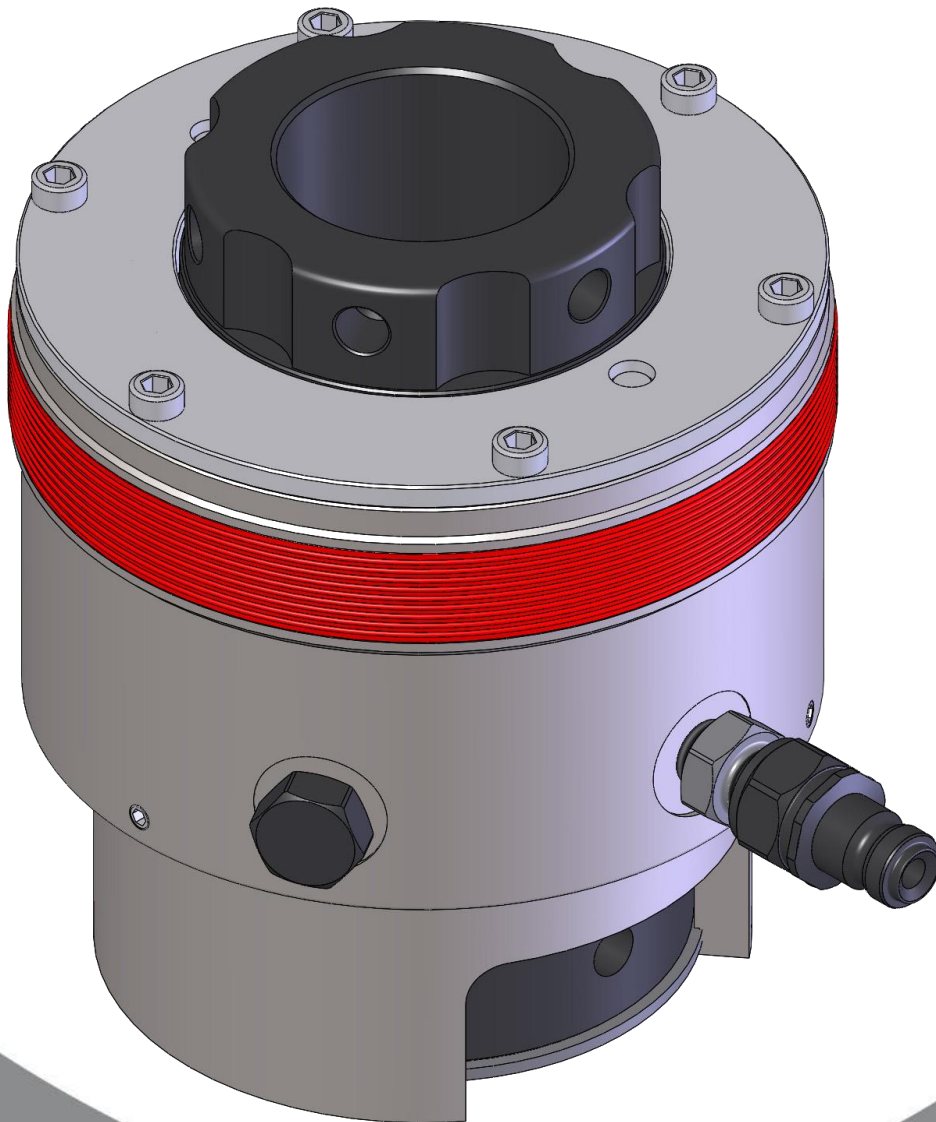


**B3S EziJac  
OPERATOR'S INSTRUCTION MANUAL**



**B3S Series EziJac<sup>®</sup>  
Spring Return Modular Models  
Instruction Manual**

Technofast Industries Pty Ltd  
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REV-8 September 2016



Thank you for purchasing your B3S Spring Return Modular EziJac. When reading through this document you may find it useful to have a copy of the drawing on hand for quick reference.

The B3S EziJac described in this manual is a high pressure hydraulic bolt tensioning tool. The tensioner is made up of a high pressure load cell which is hydraulically charged to generate a high bolt load. The Load Cell consists of a ram, an outer cylinder and two high performance seals. The tool contains a spring return mechanism to return the ram to its starting position automatically upon release of the hydraulic pressure. The tool contains a Puller with a knurled band on the exterior for manual operation, along with holes to allow for tightening with a suitably sized pin spanner. Tightening and loosening of the application's hex nut is accomplished with a Nut Rotator which is also tightened via pin spanner holes.

The Load Cell is connected hydraulically and has a Cejn nipple attached for pressurisation. The seals contained within the Load Cell are high performance polyurethane seals capable of operating well in excess of stated maximum pressures. All tools and pumping equipment supplied with the B3S EziJac's by Technofast Industries are safe for use at these pressures. If using hoses and pumping equipment not supplied by Technofast Industries the user must ensure that pumps and hoses are rated to or above the 1500 bar operating pressure of the tool. If you are in doubt that any hoses and/or pump to be used are rated to these pressures please contact your Technofast Industries Agent for further information.

The Load Cell has been designed for pressurisation whilst being supported by the Bridge. With the Bridge in position the tool is designed to suit the customer's specific application. The tool has been designed to work with the permanent hex nuts as per the specification supplied by the customer. The Bridge contains an access window to allow rotation of the Nut Rotator via a pin spanner. The Nut Rotator has been designed to fit the AF (across flats) dimension of the customer's hex nuts. The Nut Rotator is suspended inside the Bridge by a Retaining Circlip.

The maximum stroke of the B3S EziJac is 15mm and should never be exceeded even though the EziJac has been designed with a positive stop to prevent over-stroking of the tool. The tool has a stroke limit marking and should this become visible to the operator during use, then the pressure within the tool should immediately be released to prevent damage.



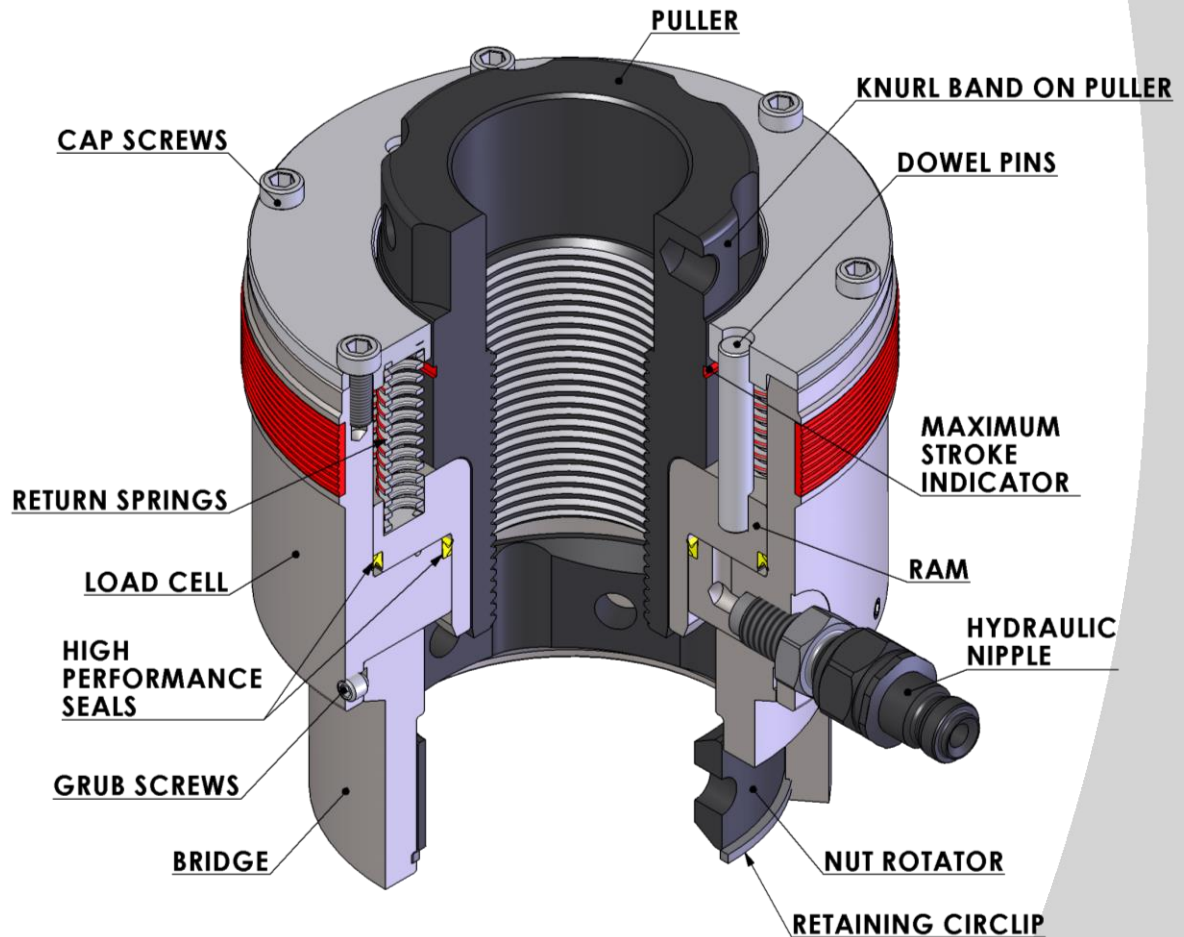
The EziJac has been fitted with a spring return mechanism. It consists of a series of heavy duty springs which will return the Ram to the zero position when pressure is released from the tool. To prevent spring component damage, the working stroke limits should be strictly enforced throughout use.

The operator should always record the total number of pressure cycles to which the tool has been subjected. When the tool is reaching the maximum number of pressure cycles stated within the technical information the tool should be returned to Technofast Industries for replacement of components which may be subject to metal fatigue. This will assure the reliability of the tool.

The B3S EziJac must not be modified by any means, including grinding, machining, welding or brazing. If any modifications have been attempted, then any express or implied warranty will be void.

Prior to dispatch, each tool is subjected to a high pressure test as noted in accompanying Product Certification documents. This operation has been carried out under strict safety guidelines and conditions. Maximum operating pressure (see tool specifications detailed) should not be exceeded by the user at any time. Should re-certification of the tool be required, then it must be returned to Technofast Industries for testing and certification.

## EZIJAC COMPONENTS



## GLOSSARY:

- ◆ **Load Cell :** The power module assembly comprising of the Cell Piston, Cell Ram, Top Cap and fitted Seals.
- ◆ **Puller :** Screws onto the thread of the bolt to be tensioned.
- ◆ **Bridge :** This is a separate component that sits between the Load Cell and the flange and has an access window to allow the hex nut to be wound down via the Nut Rotator.
- ◆ **EziJac :** The entire unit assembled ready for operation.

*YOUR EziJac<sup>®</sup> COMES PRE-ASSEMBLED AND READY FOR OPERATION.*



## HEALTH AND SAFETY NOTICE

The Technofast Industries EziJac range of tools are capable of producing very high hydraulic pressures and high bolt stresses. It is therefore extremely important that all staff operating the tools are aware of the correct operating procedures, and of health and safety requirements for the use of such equipment.

All personnel operating the equipment must be properly trained in the correct operating procedures for these tools to ensure the safety and wellbeing of personnel. If you require training, Technofast will be pleased to offer the correct training course either at our facilities or on site anywhere in the world.

Please ensure that all operators and personnel working with the EziJacs receive a copy of this document and fully understand all of its contents. Do not allow anyone to operate this equipment if they are not experienced with hydraulic bolt tensioning equipment or have not received suitable training.

### **Important Note:**

During the operation of Technofast Industries EziJacs extremely high bolt stresses are produced. If the incorrect bolt material or incorrect installation methods have been used then damage to the subject bolt or the tool may occur. Should a bolt snap under load, then there is a possibility that the reactive force may 'launch' the tool from the application. It is crucial that no personnel are allowed to stand along the axis of the bolt or in close proximity to the tensioner or hydraulic pumping equipment. Failure to do so may result in serious injury.

### **The following health and safety instructions for hydraulic hoses must be observed.**

- Discard and do not use any hose that shows any sign of damage either :-
  1. To the clear PVC protective cover.
  2. To the coloured moulded plastic coating
  3. Where the spiral windings have been exposed
  4. Where the spiral windings are damaged or broken
  5. Where there is damage to the swaged metal ends
- Hoses must not be kinked or knotted, Doing so will cause damage the the metal windings of the hose and the hose must be discarded.
- Do not allow heavy objects to fall on, rest on, or roll over the hoses.
- Hoses must never be subjected to temperatures greater than 60°C.
- Any hose which has been subjected to heat or fire must be discarded immediately.
- Do not bend the hose tighter than the minimum bending radius of the hose or damage to the steel windings will occur and the hose must be discarded.



- Never exceed the maximum working pressure of a hose. This is marked on the hose and can also be determined by the colour :-  
Yellow = 720 bar  
Blue = 1800 bar  
Red = 2500 bar
- Never use a hose for any purpose other than which it is intended.
- Keep different pressure rated hoses separate and never interchange the connections as these all have different pressure ratings.
- Once finished with the hose wipe of any contaminants and inspect the hose for any signs of damage or leakage.
- Always replace the dust caps of the fittings to prevent foreign material or contaminants entering the hydraulic system.
- Store hoses in a safe place where they can not be damaged when not in use.
- Never pressurise a quick connect nipple as damage to seals may occur.
- Check that the Technofast Industries tools are compatible with the hoses being used. All tools are laser marked with the maximum allowable pressure.
- Never use a hose attached to a tool as a carry handle.
- Never hold a hose under pressure and stand well clear of pressurised hoses and tools.
- Never remove fittings from the hoses as this will cause all pressure tests to be invalid. If for any reason fittings need to be replaced it is recommended that the hose assembly be return to Technofast Industries for pressure testing and certification.





## **OPERATING PROCEDURE: Checks before Tensioning & De-Tensioning**

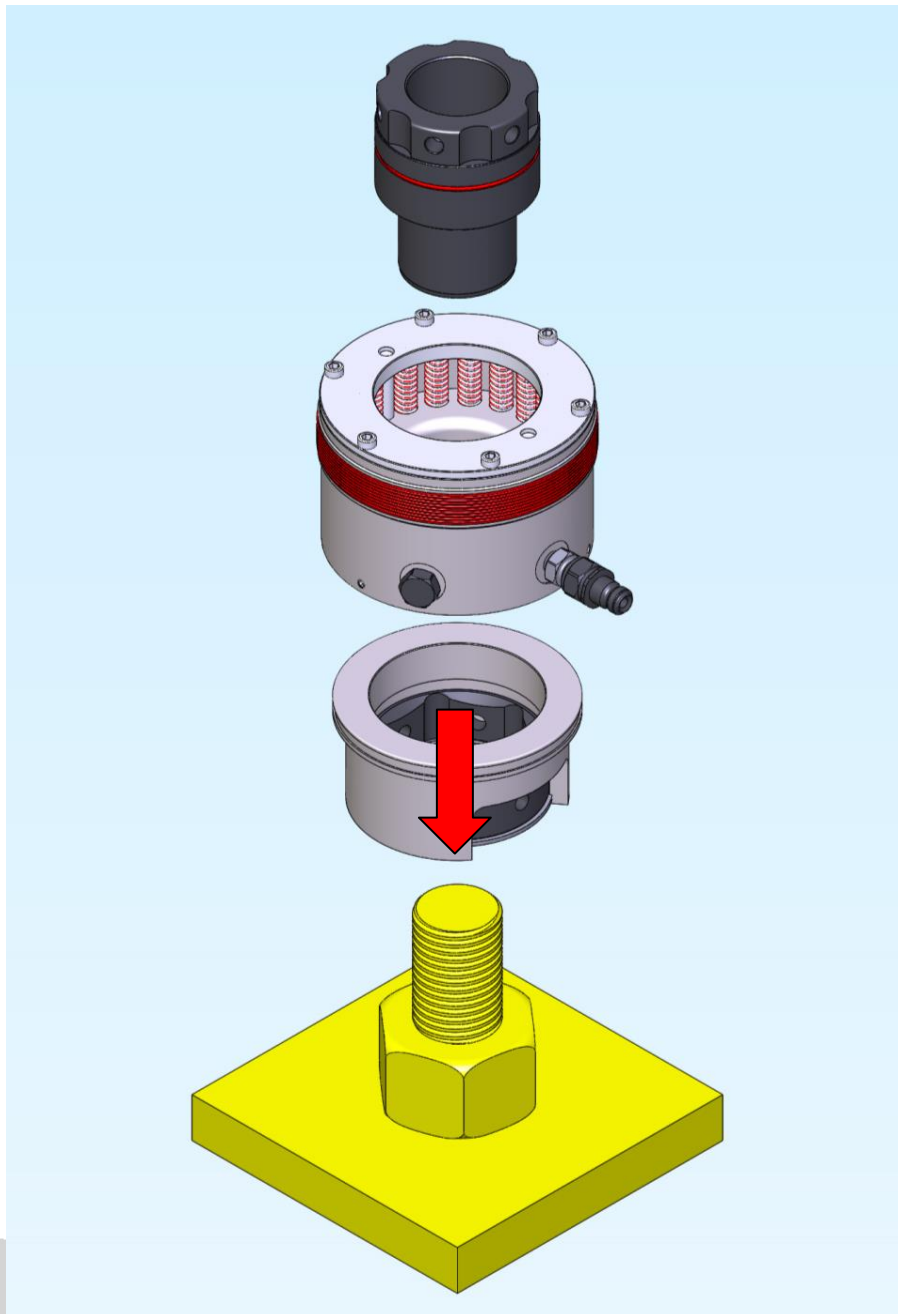
1. Before Tensioning or De-Tensioning begins please ensure all personnel read and comply with all of the health & safety information contained in this document.
2. Ensure that there is a minimum stud protrusion of at least ONE times the diameter of the bolt. (ie- a bolt with a diameter of 30mm will require at least 30mm of stud protrusion to ensure adequate thread for the Thread Puller to grip onto.)
3. Clear the surrounding surface around the nut and flange assembly to be tensioned. *Make sure there are no surface protrusions or unevenness that may prevent uniform seating of the EziJac.*
4. *Ensure that RAM is fully retracted prior to pressurisation. Observe / monitor the Ram movement proportional to its maximum stroke.*
5. *Do not exceed 1500bar. (21,750psi )*
6. *Prior to applying pressure to the system, ensure that all quick release couplings are firmly coupled together. Do not pressurise unconnected couplings.*

*Above information is based on minimum requirements. Extra safety requirements may be necessary after further risk assessment*

## OPERATING PROCEDURE: Tensioning

### STEP 1

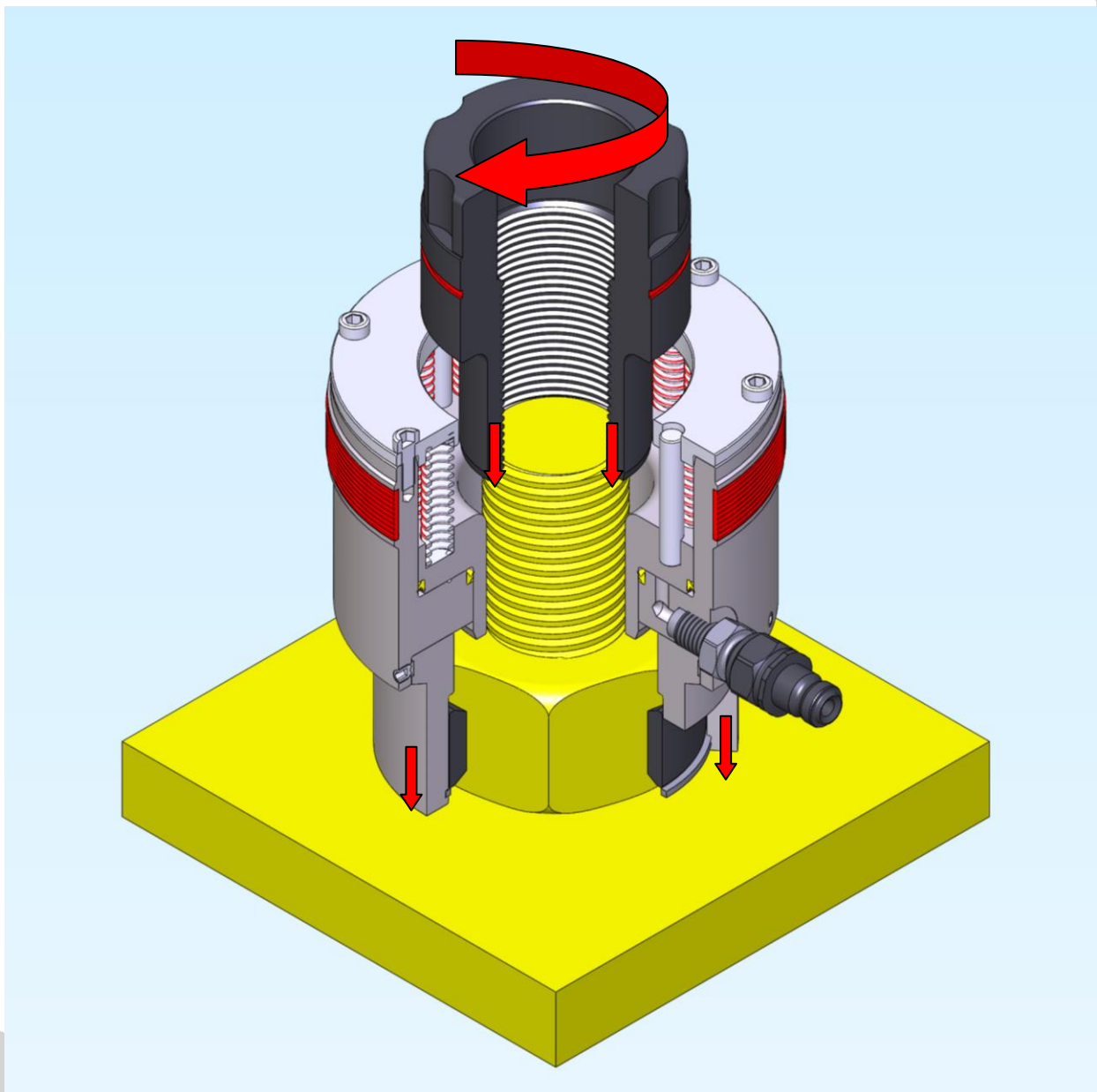
Place the **Bridge & Nut Rotator** over the existing hex nut and ensure the nut is located properly within the Nut Rotator.





## STEP 2

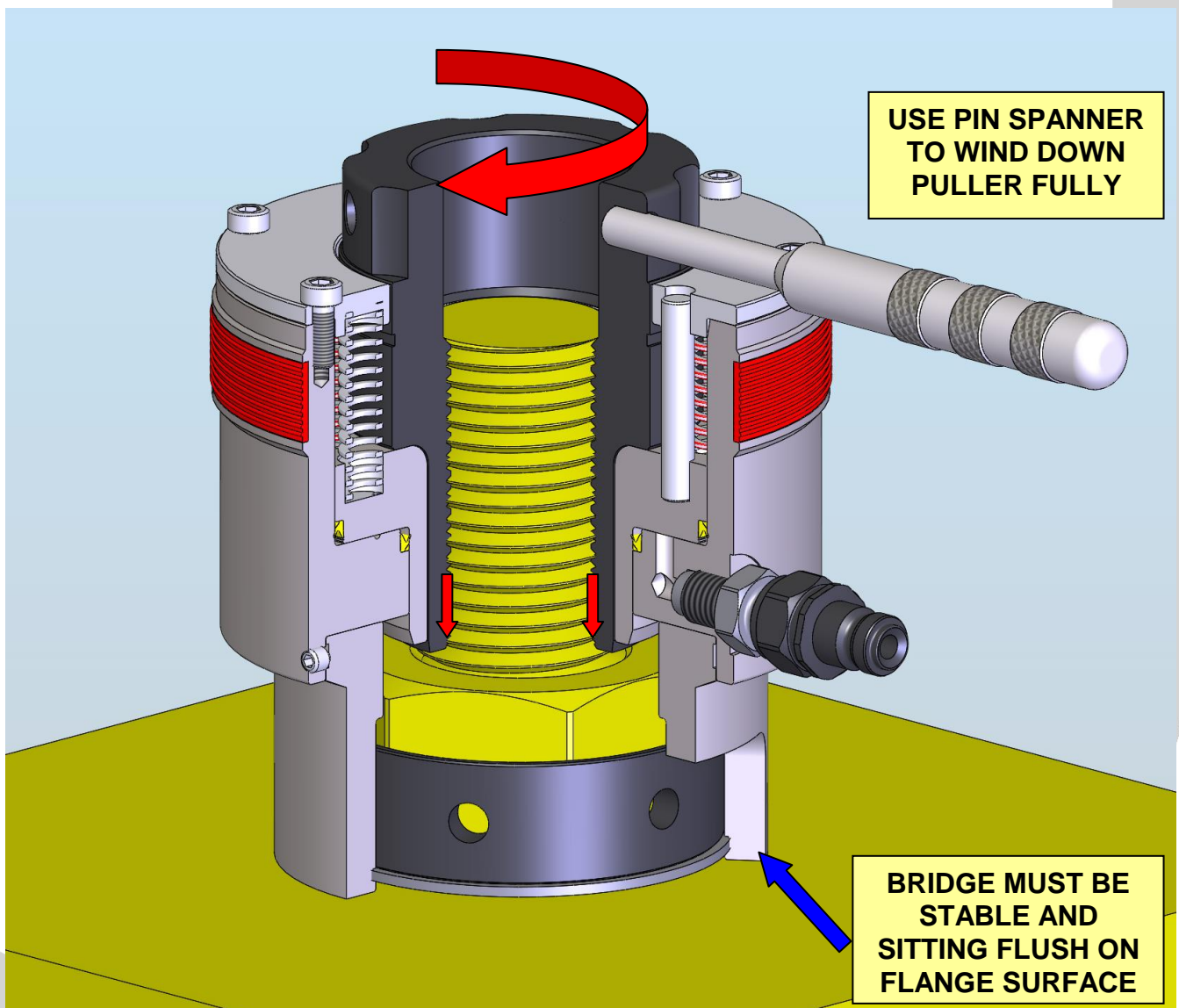
Locate the EziJac Load Cell onto the Bridge and begin to thread the **Puller** onto the bolt by screwing down the knurled band on the Puller clockwise by hand. Continue to wind the Puller down the stud until the bridge sits firmly on the flange surface.





## STEP 3

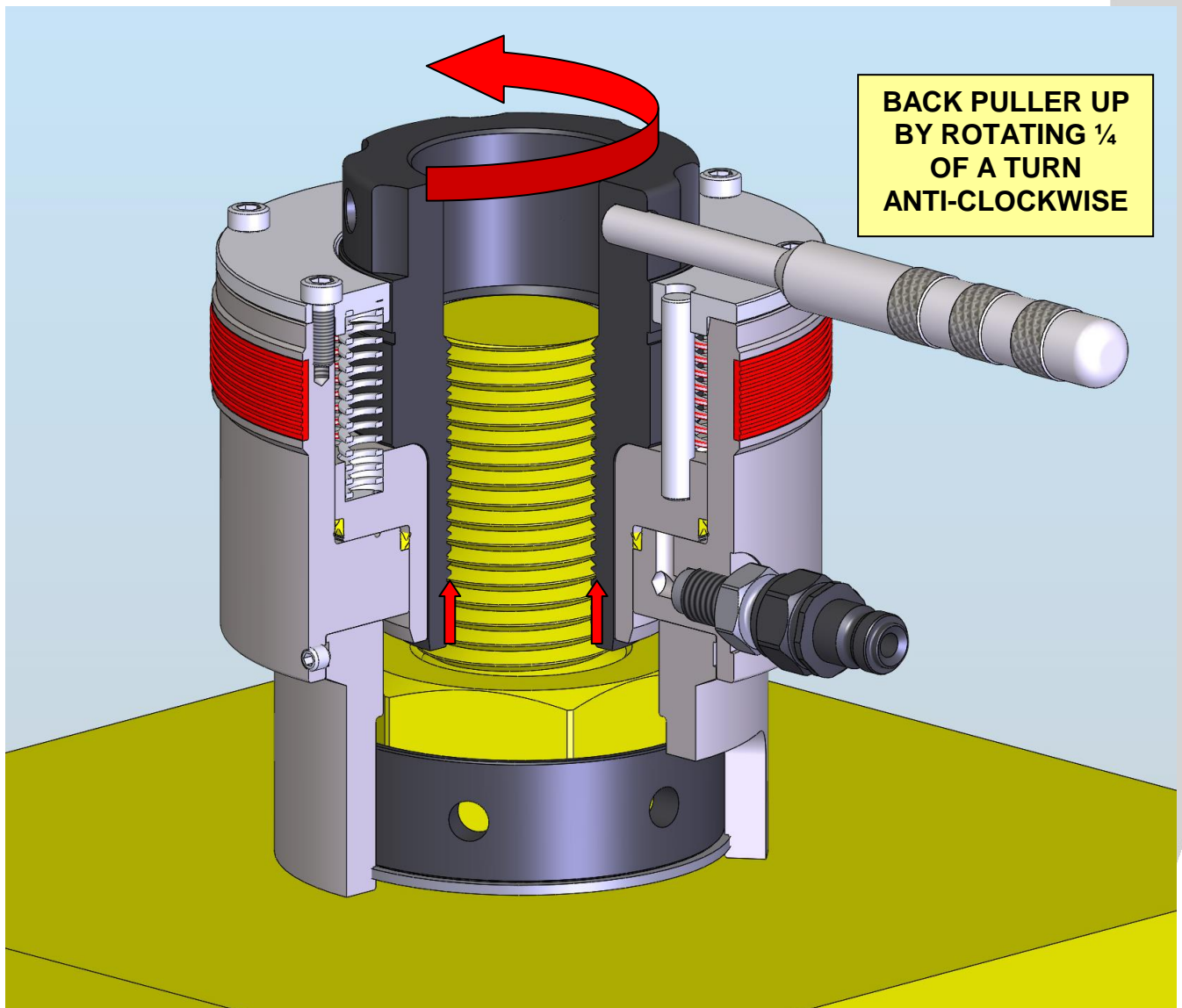
Nip the **Puller** up tight by inserting the pin spanner into the holes of the Puller and rotate clockwise until the **Load Cell** is at the starting position to allow for a full working stroke. This will occur when the bottom of the Knurl band on the Puller is sitting level with the top of the Load Cell. The **Bridge** should be stable and sitting evenly on the flange surface. There should be no gap between the Bridge and the flange. If there is a gap, then continue threading down the Puller with the pin spanner.





## STEP 4

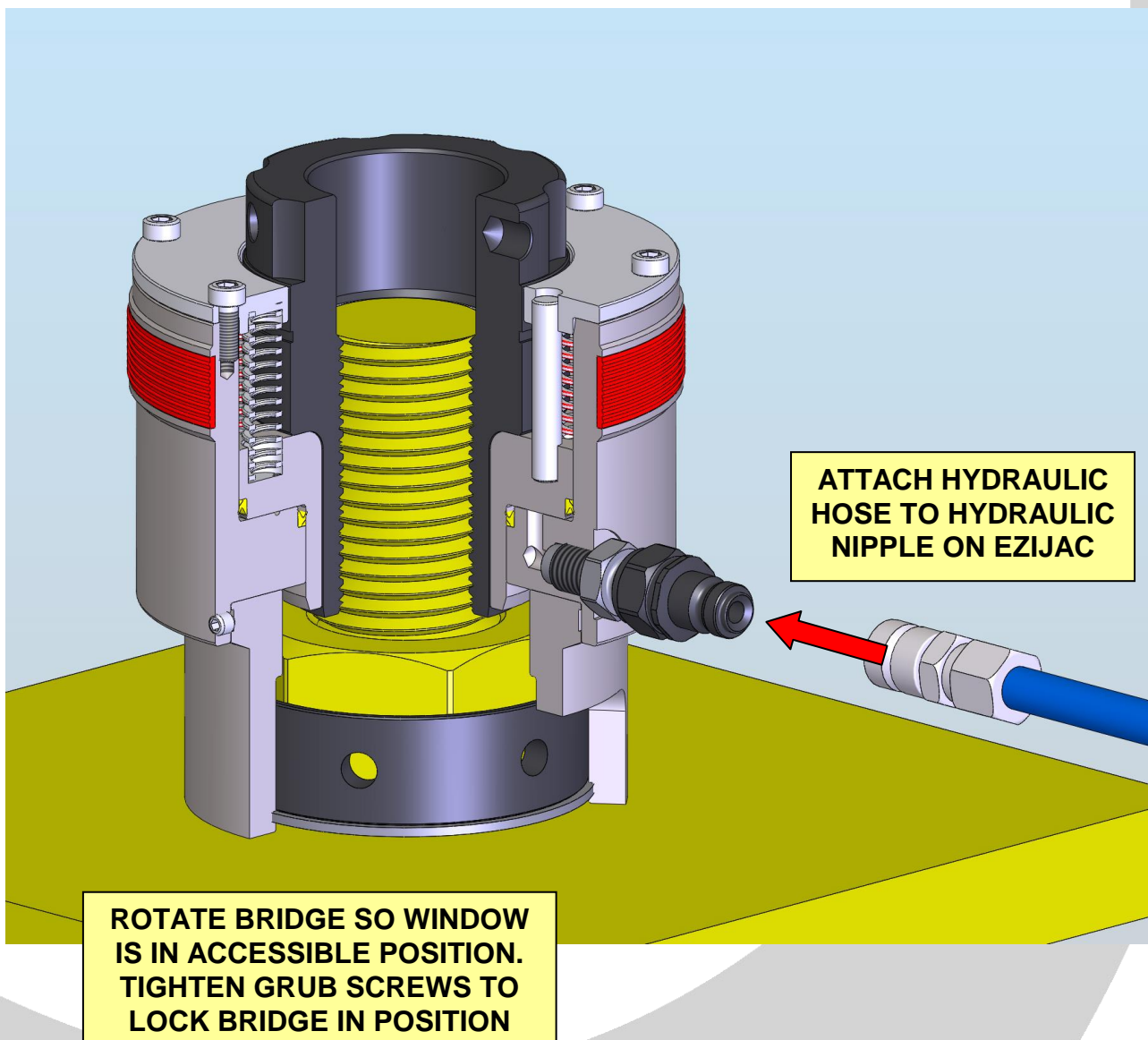
When the Bridge is properly seated on the surface of the flange, back the Puller off a  $\frac{1}{4}$  of a turn by hand or by using the pin spanner. Doing this will avoid the possibility of the Bridge locking up against the Flange upon release of pressure.





## STEP 5

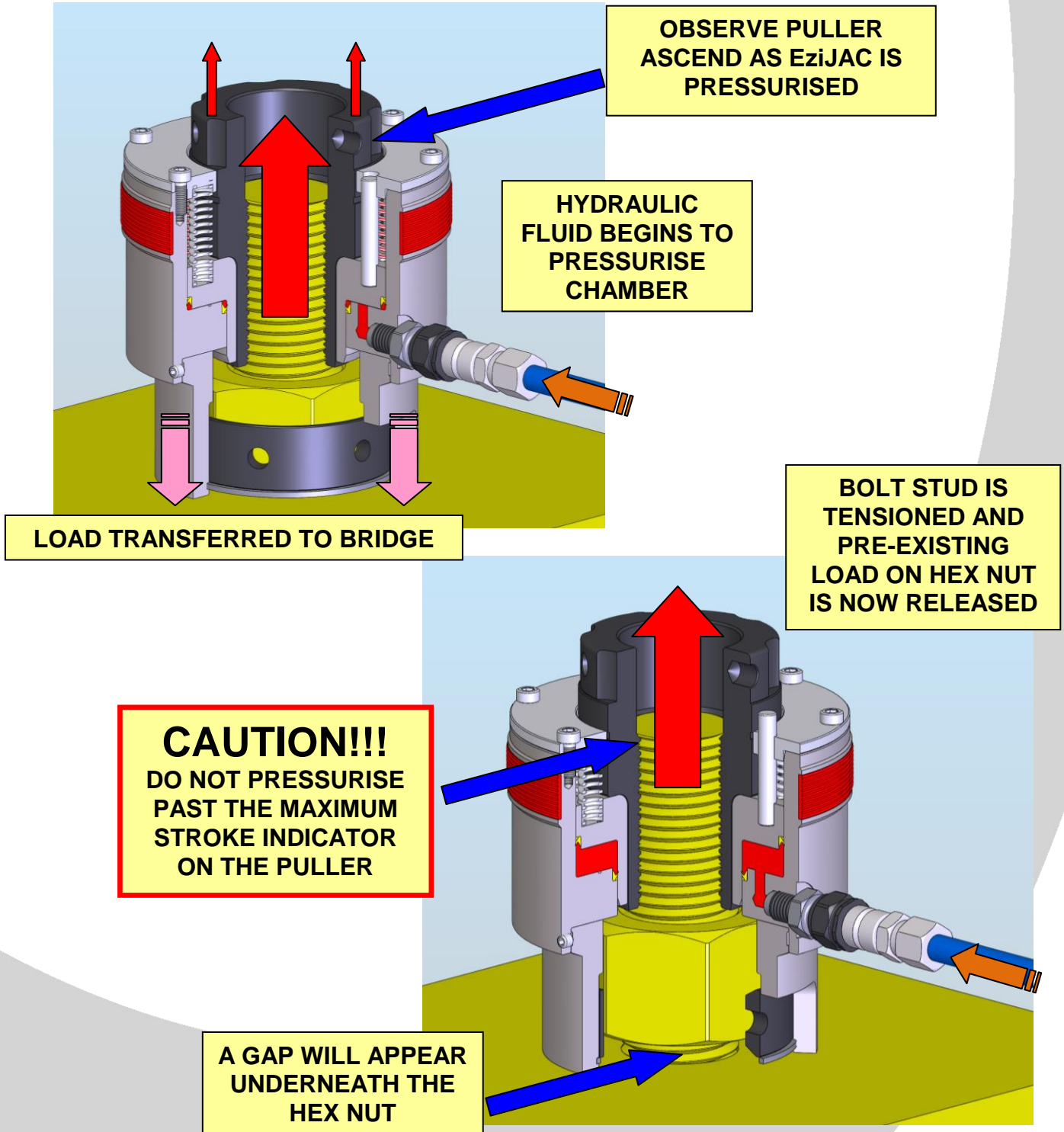
Once the Technofast EziJac is in place, the bridge should be rotated so that it is in a suitable position to be accessed when required. Tighten the **Grub Screws** to lock the load cell to the bridge. Attach the hydraulic pump (*Tensioning pump*) to the **Hydraulic Nipple** via the supplied link hoses (in multiple tensioning situations please see the diagrams on page 32). Ensure that the coupling is fully engaged with the nipple.





## STEP 6

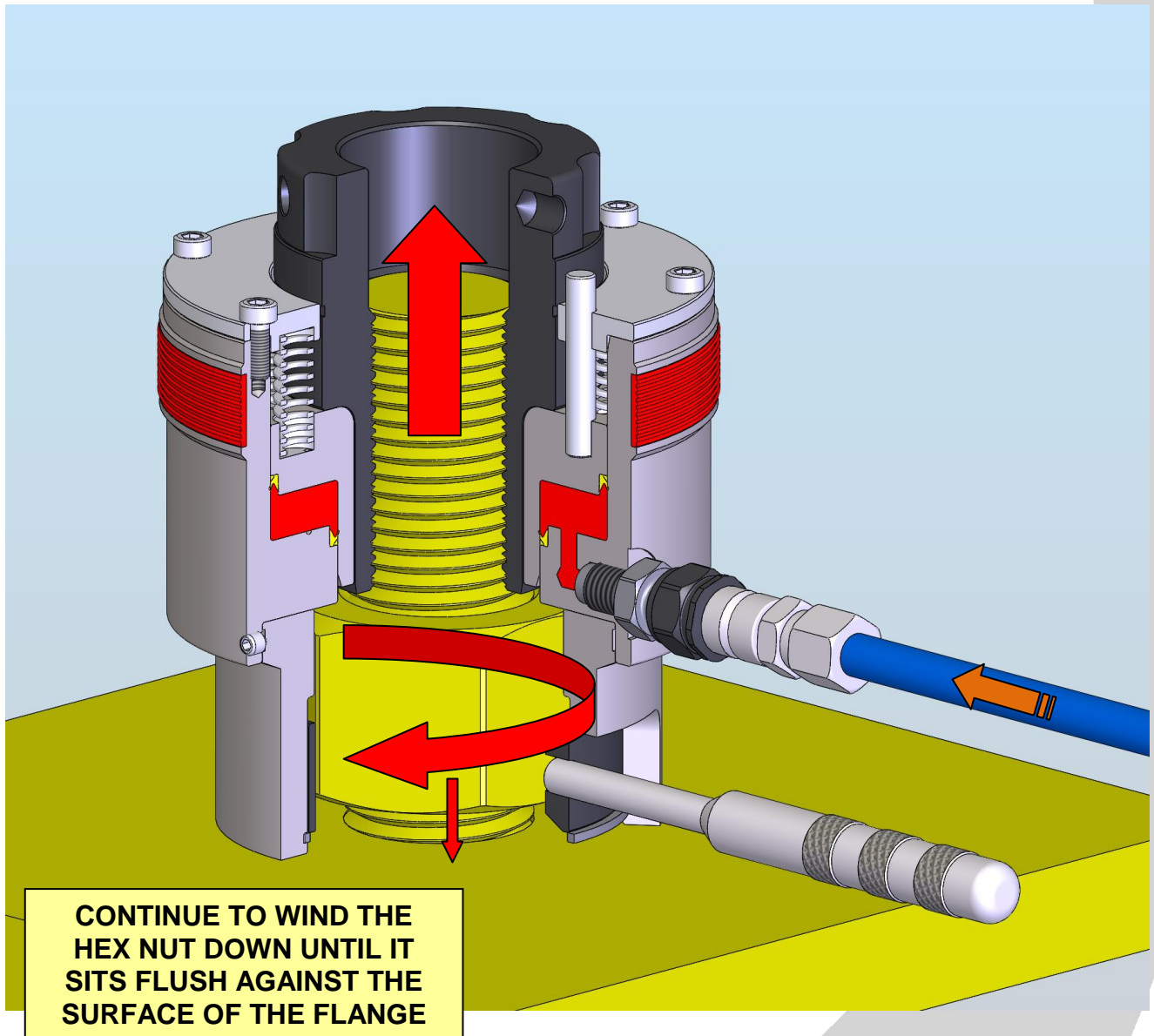
Using the Hydraulic pump, pressurise the EziJac until the desired pressure is reached (refer to Load VS Pressure Chart supplied for your specific EziJac Model). DO NOT exceed the recommended tensioning pressure for the tool. *In multiple bolting situations, it may be desirable to apply this tensioning force in a number of steps.*





## STEP 7

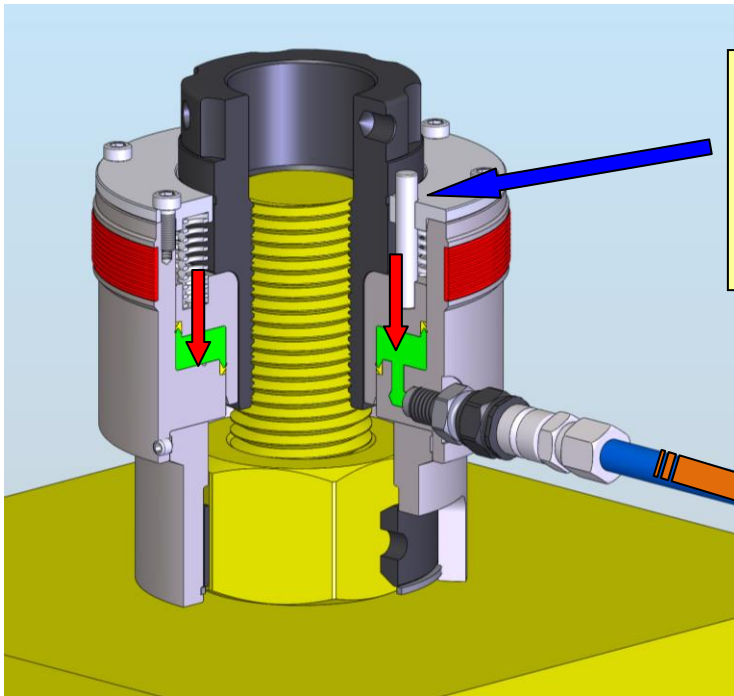
Once full pressure is achieved the bolt will be adequately tensioned and the existing load removed from the hex nut. Insert the pin spanner into one of the holes in the Nut Rotator and wind the hex nut down clockwise via the Nut Rotator.





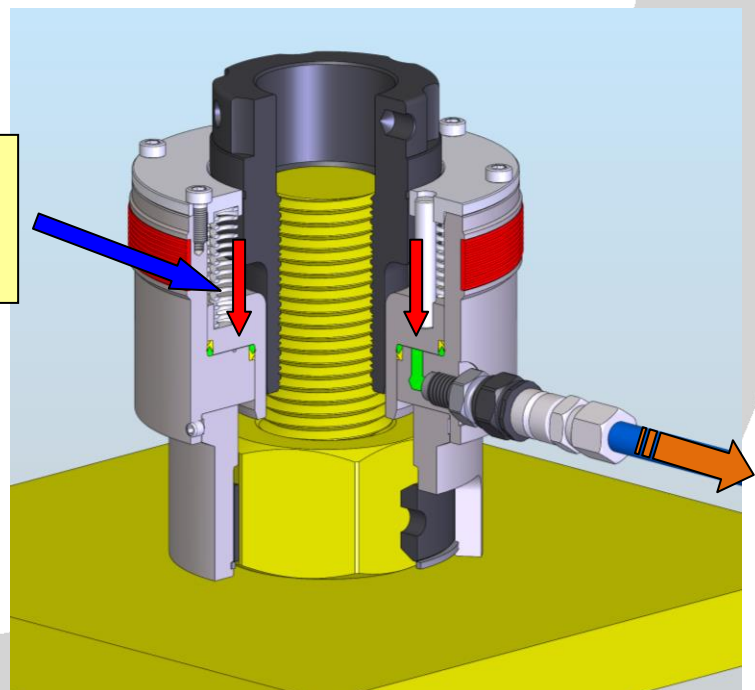
## STEP 8

Once the hex nut is wound down as far as possible remove the pin spanner from the Nut Rotator and begin to slowly depressurise the EziJac. This will transfer the load back onto the hex nut. The return **Springs** will push the hydraulic fluid from the pressure chamber and return the **Ram** to its starting position.



THE TRAVEL OF THE PISTON IS INDICATED BY THE PROTRUSION OF THE 2 DOWEL PINS FROM THE TOP FACE OF THE LOAD CELL

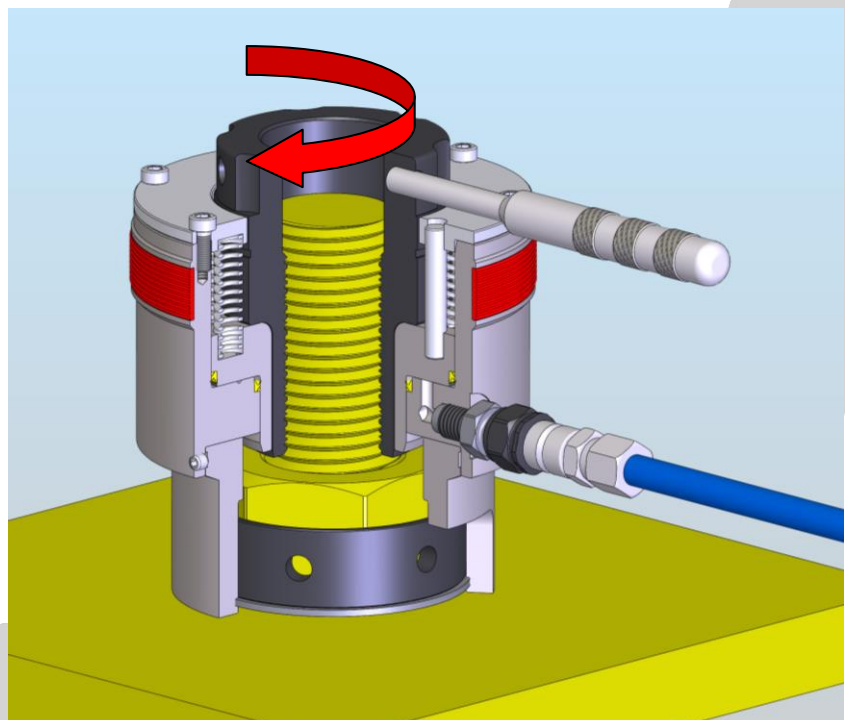
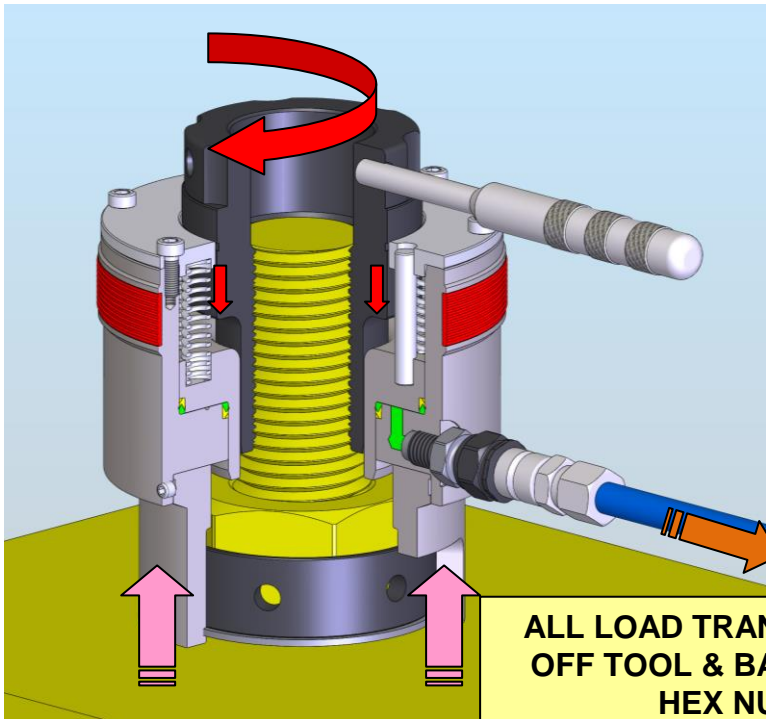
SPRINGS WILL RETURN RAM TO STARTING POSITION





## STEP 9

To ensure the tool is returned fully to its starting position and to release all pressure/load from the tool, use the pin spanner to wind the Puller down the stud by turning clockwise until no further downward movement is observed. **Ensure the release valve is open on the pump before starting this step.**





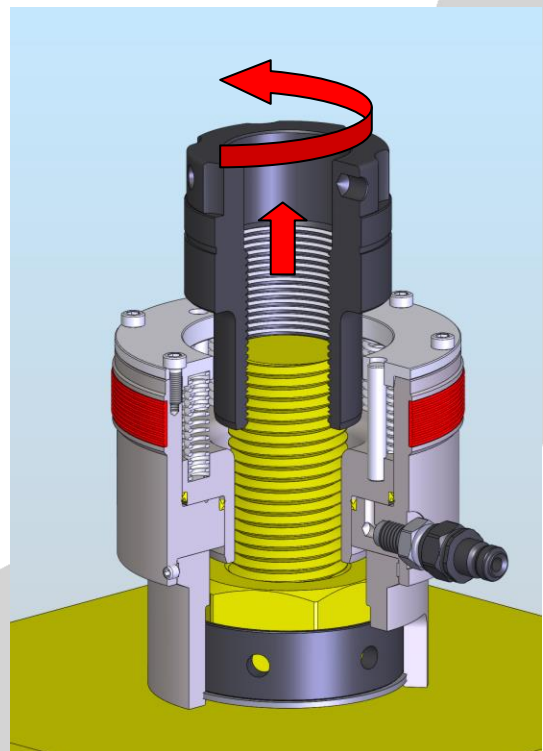
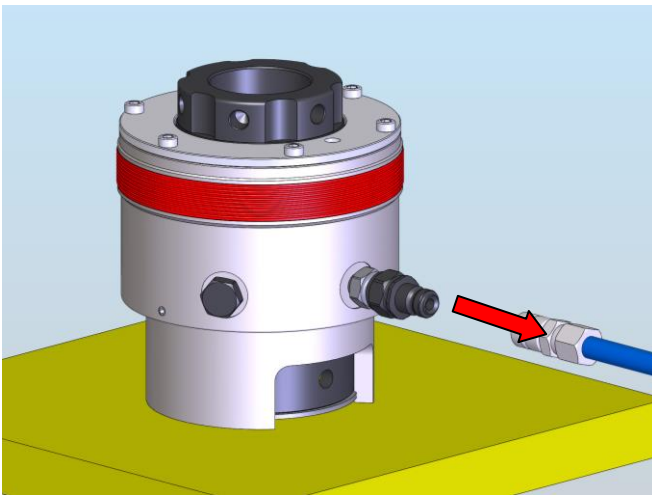


## STEP 10

Repeat STEPS 1-9 to compensate for any relaxation between the joint interfaces.

## STEP 11

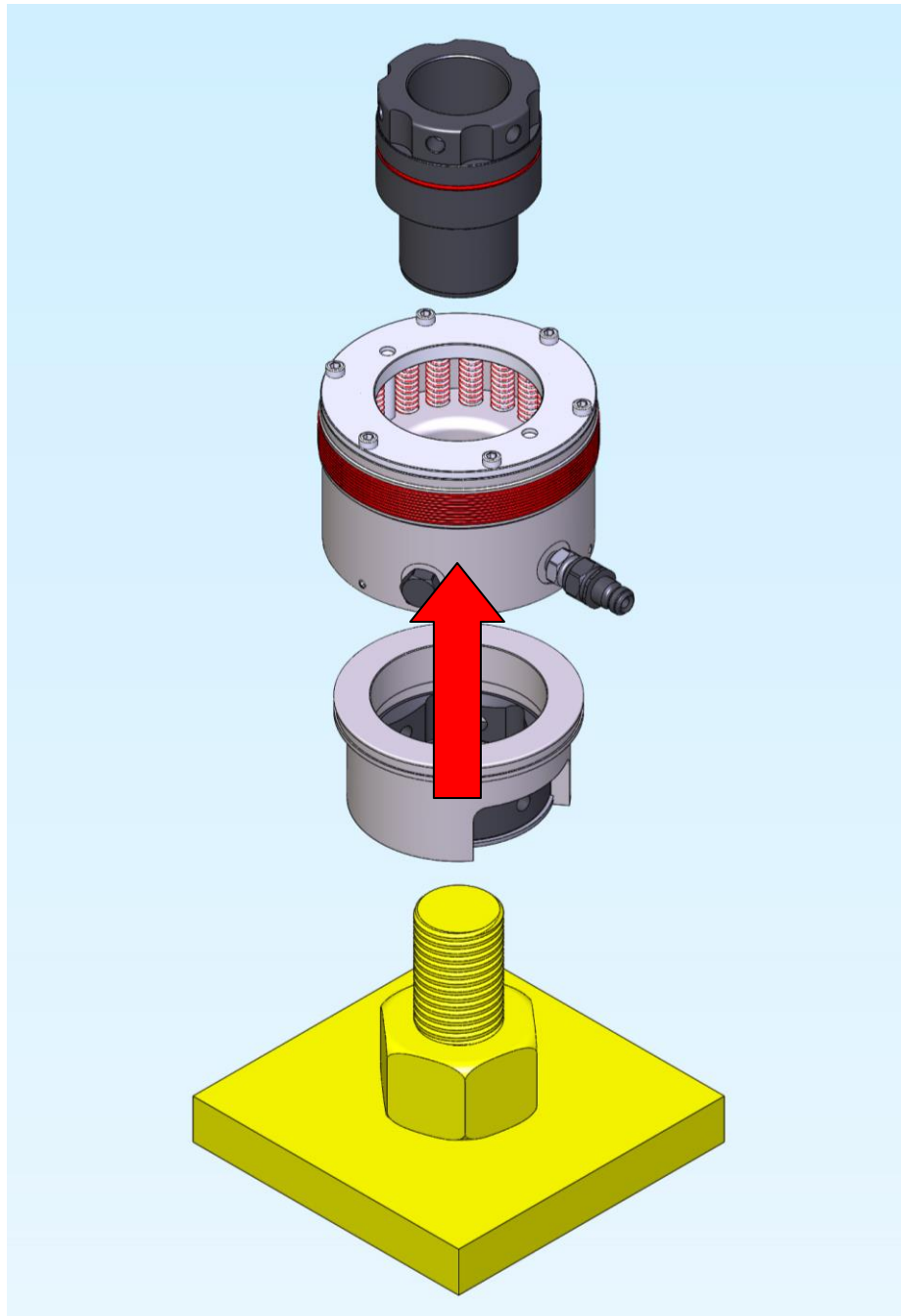
After completion of the bolt tensioning, ensure pump is turned off then disconnect the hydraulic hose from the Hydraulic Nipple on the EziJac. Unscrew the **Puller** from the stud by turning anti-clockwise with the pin spanner initially and then by hand once it rotates more freely. Continue unscrewing the thread puller until it is clear of the stud.





## STEP 12

Remove the **Complete EziJac Assembly** from the tensioned bolt.



***This completes the Tensioning Procedure for the EziJac.***

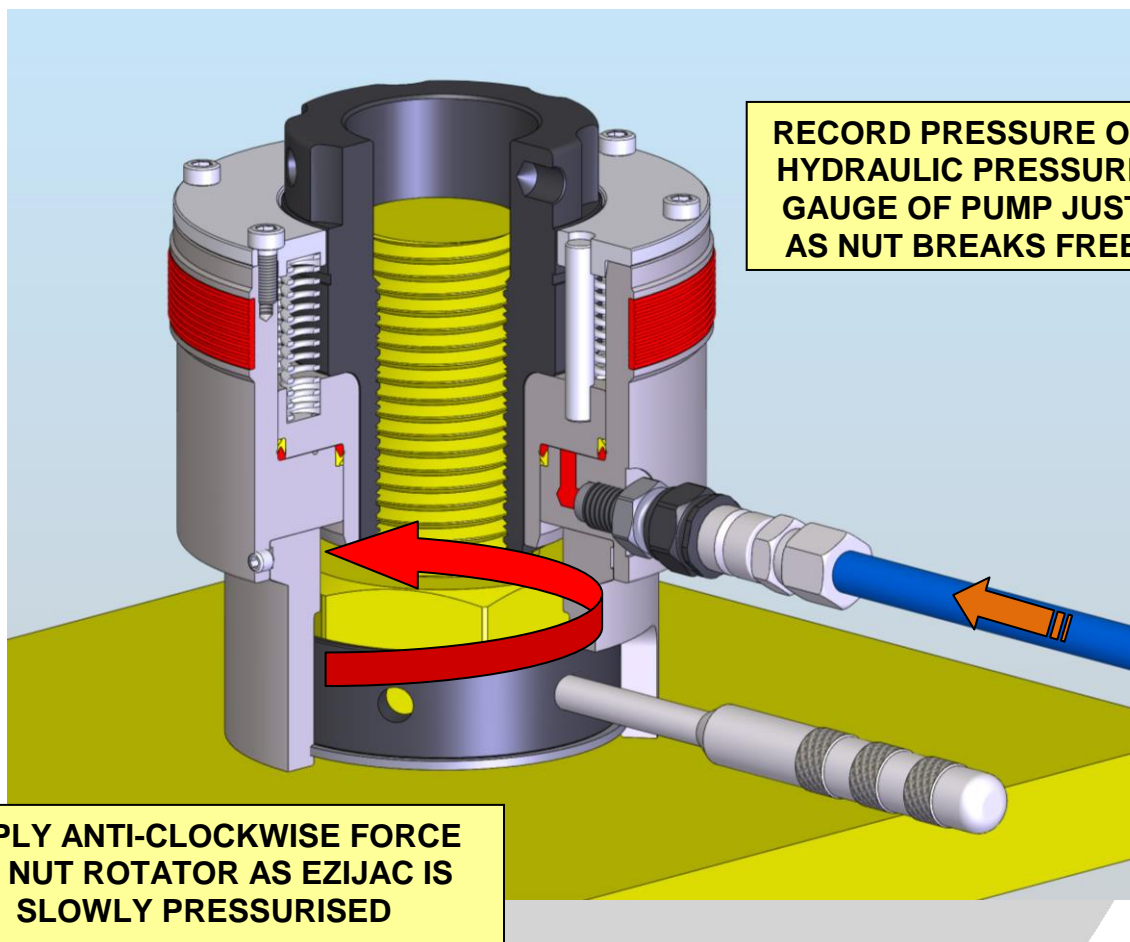


## OPERATING PROCEDURE: Checking the Load on a Bolt

If an accurate reading of the load on the bolt is desired, return one of the EziJac's to a previously tensioned bolt. Ensure the hex nut is properly seated within the Nut Rotator, thread the Puller over the stud and connect the hydraulic pressure hose (as per Steps 1-5).

Whilst slowly pressurising the **Load Cell**, use the pin spanner to apply anti-clockwise force to unscrew the nut. At the moment the nut breaks free, record the pump pressure. This will give an accurate indication of the load on the bolt.

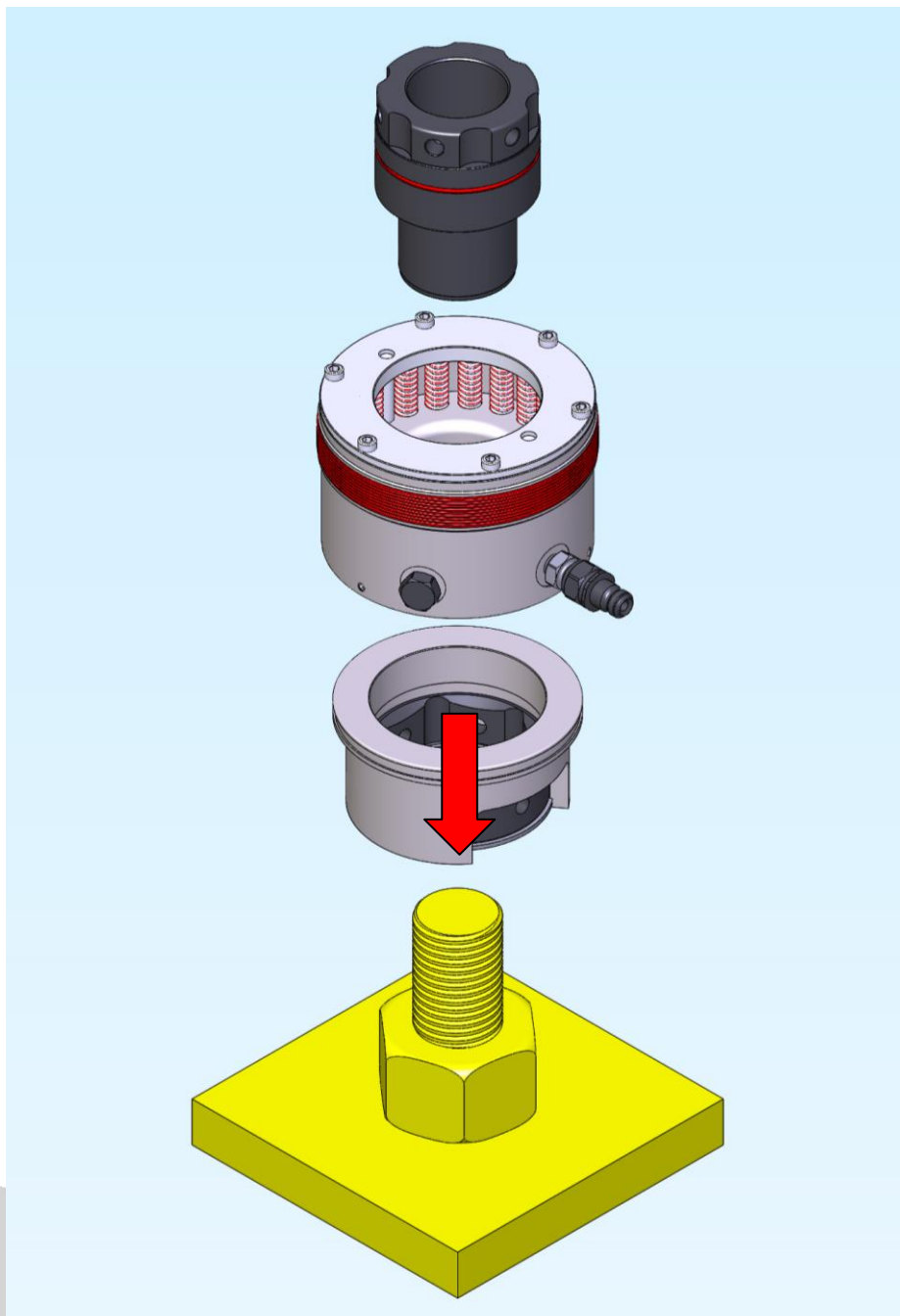
If the bolt load is determined to be insufficient, further tensioning of the studs may be required by repeating the tensioning procedure.



## OPERATING PROCEDURE: De-Tensioning

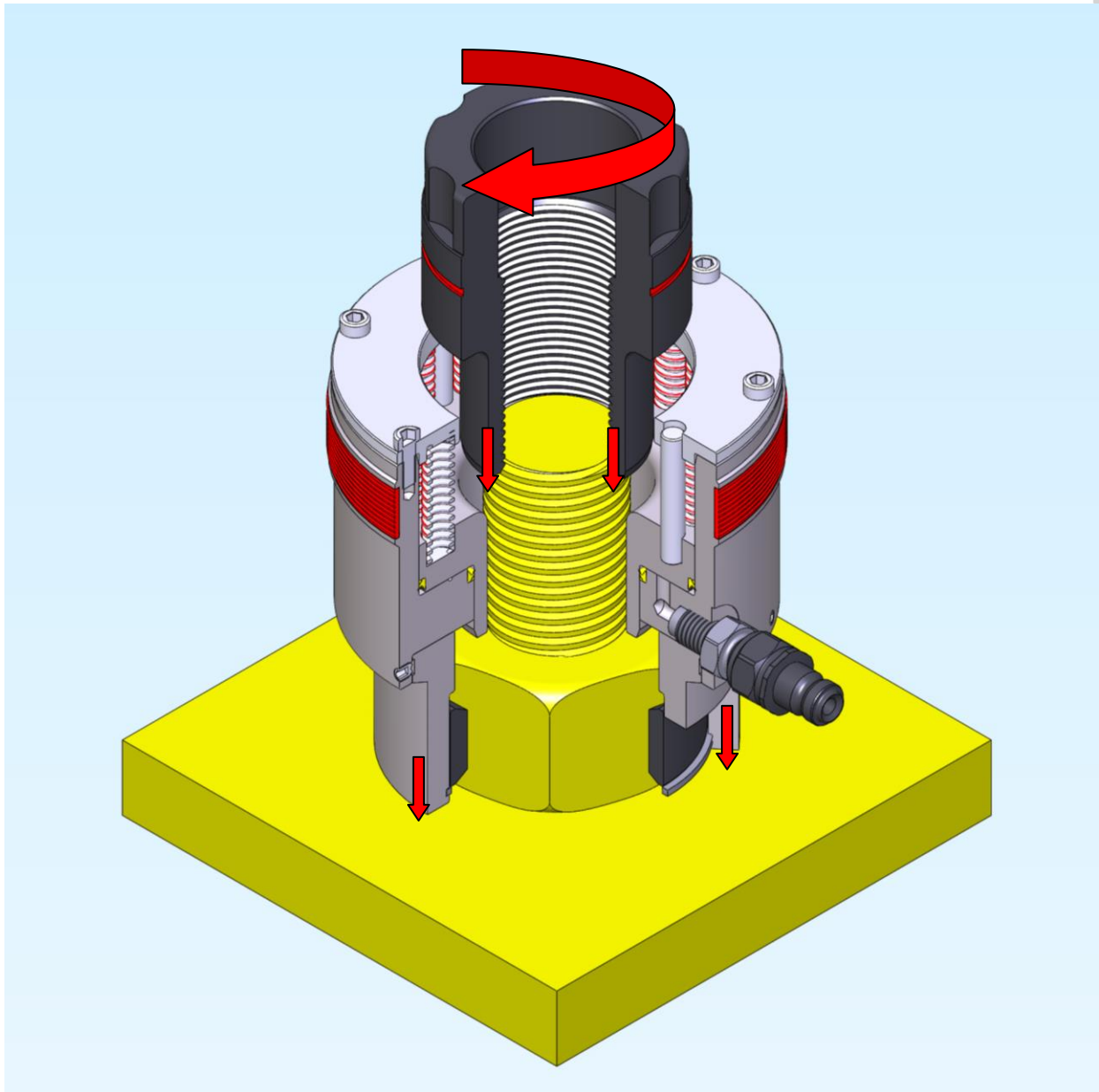
### STEP 1

Place the Nut Rotator over the existing hex nut and ensure the nut is located properly within the **Nut Rotator**.



## STEP 2

Locate the EziJac onto the existing bolt and begin to wind **Thread Puller** onto the bolt by gripping and rotating the Knurl Band on the Thread Puller clockwise by hand. Continue to wind the Puller down the stud until the bridge bottoms out on the flange surface.

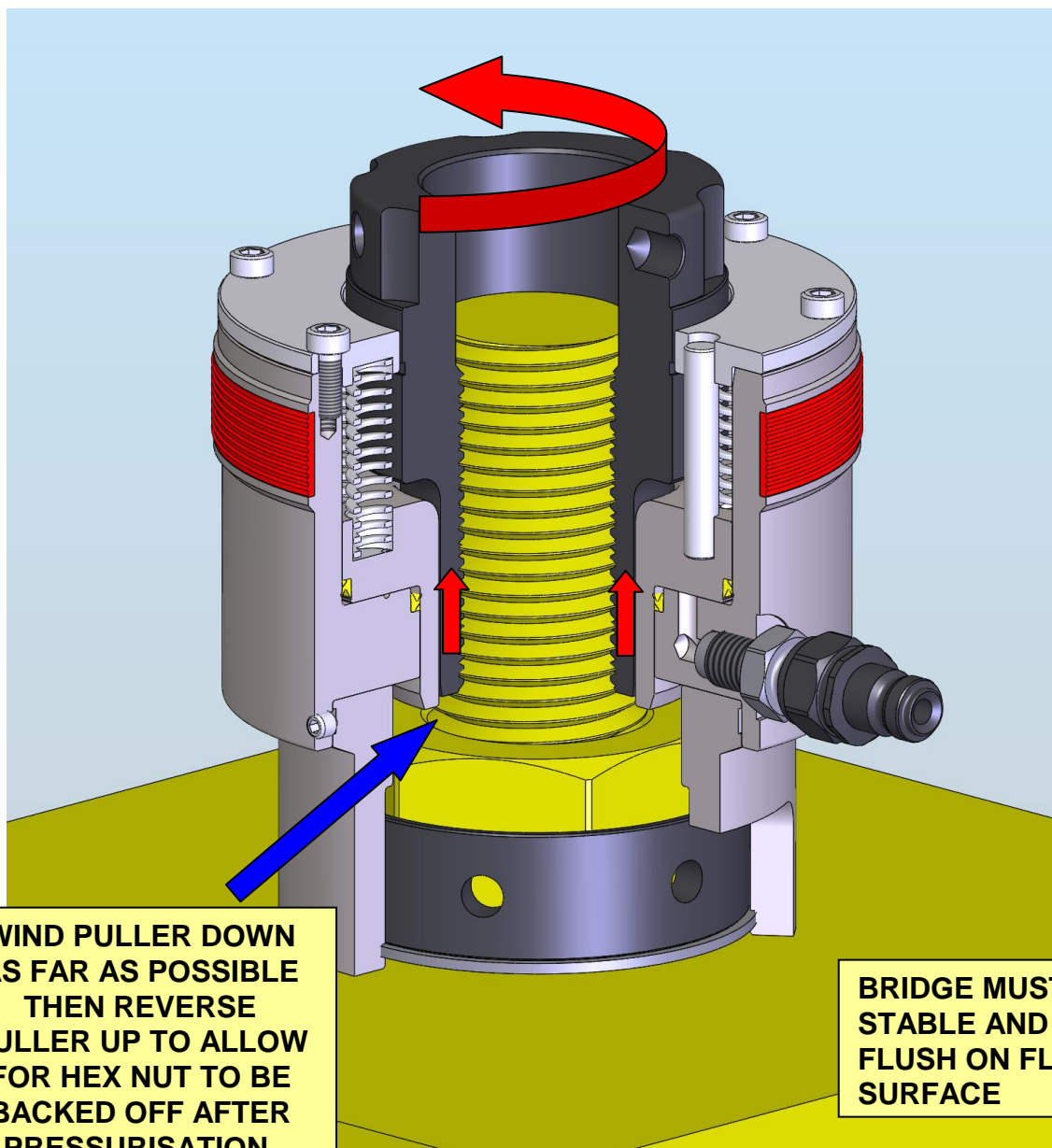




## STEP 3

Nip the Puller up by inserting the pin spanner into the holes of the Puller and rotate clockwise until the Load Cell is at the starting position to allow for a full working stroke. The Bridge should be stable and sitting evenly on the flange surface. There should be no gap between the Bridge and the flange. If there is a gap, then continue threading down the Puller with the pin spanner.

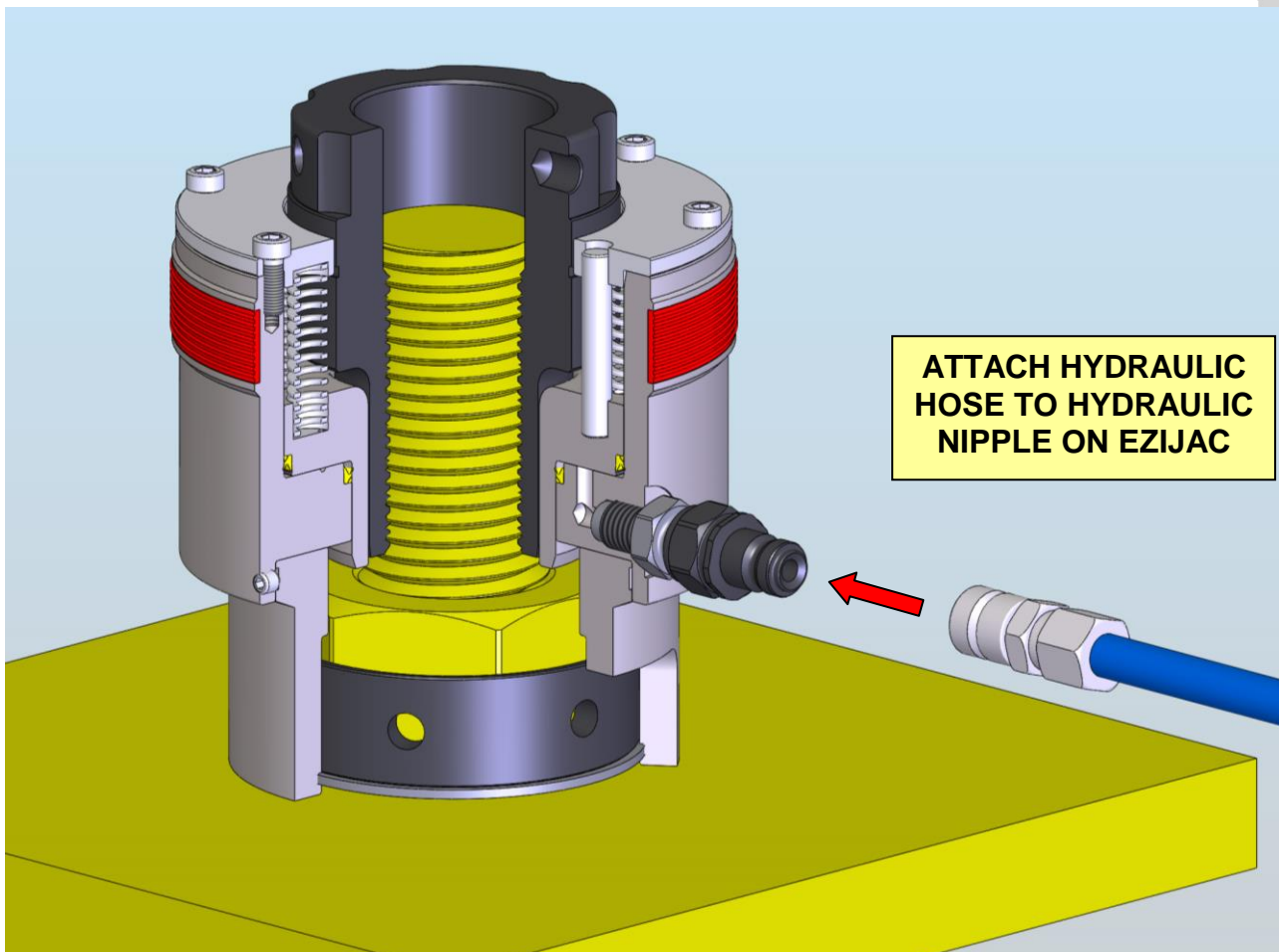
Once complete, reverse the Puller up the bolt to allow for the hex nut to be loosened without fouling on the bottom of the Puller.





## STEP 4

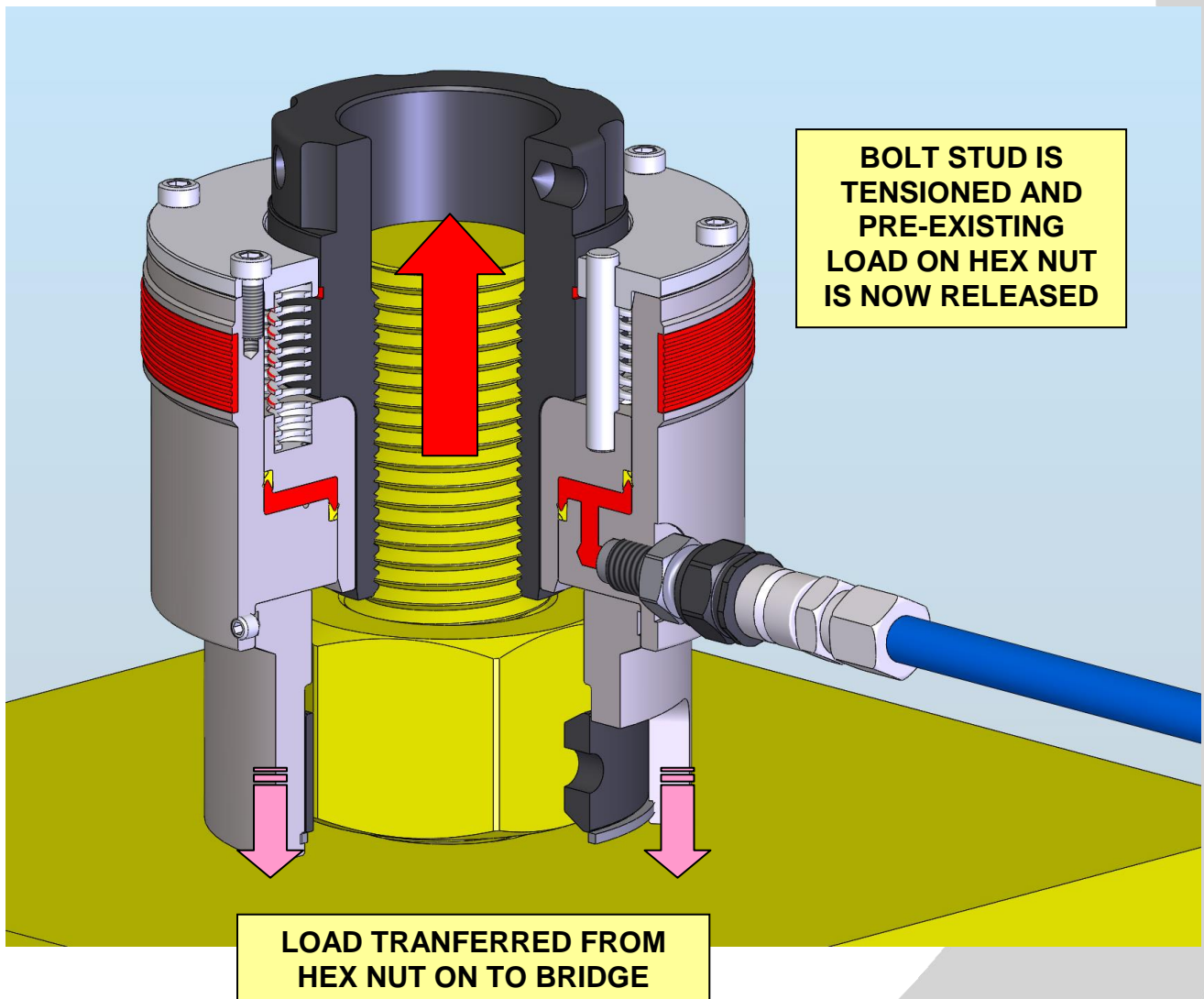
Once the Technofast EziJac is in place, the bridge should be rotated so that it is in a suitable position to be accessed when required. Connect the high pressure hydraulic hose fitted with a quick connect coupling and ensure that the coupling is fully engaged with the Hydraulic Nipple.





## STEP 5

Begin to pressurise the EziJac. The operator should be able to observe the Puller begin to ascend. **Note:** Be sure not to exceed the maximum stroke of the tool or the maximum recommended operating pressure.



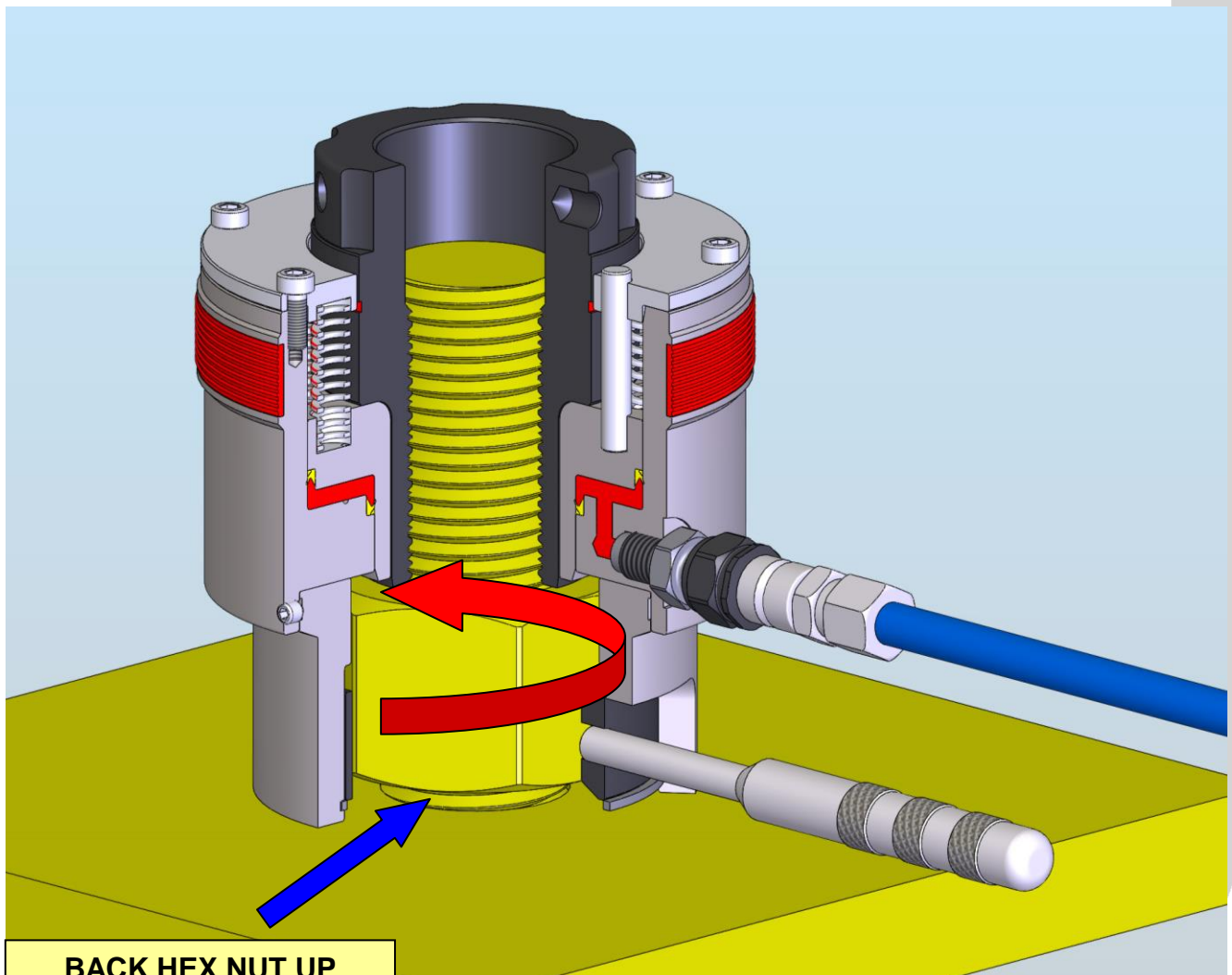




## STEP 6

Insert pin spanner into Nut Rotator and rotate anti-clockwise until the hex nut is loose and clear of the flange.

**Note:** Be sure not to loosen the hex nut so much that it fouls on the bottom of the Puller. You will know this has occurred when it becomes exceedingly difficult to continue turning the pin spanner. This will cause the hex nut to lock onto the bottom of the Puller.

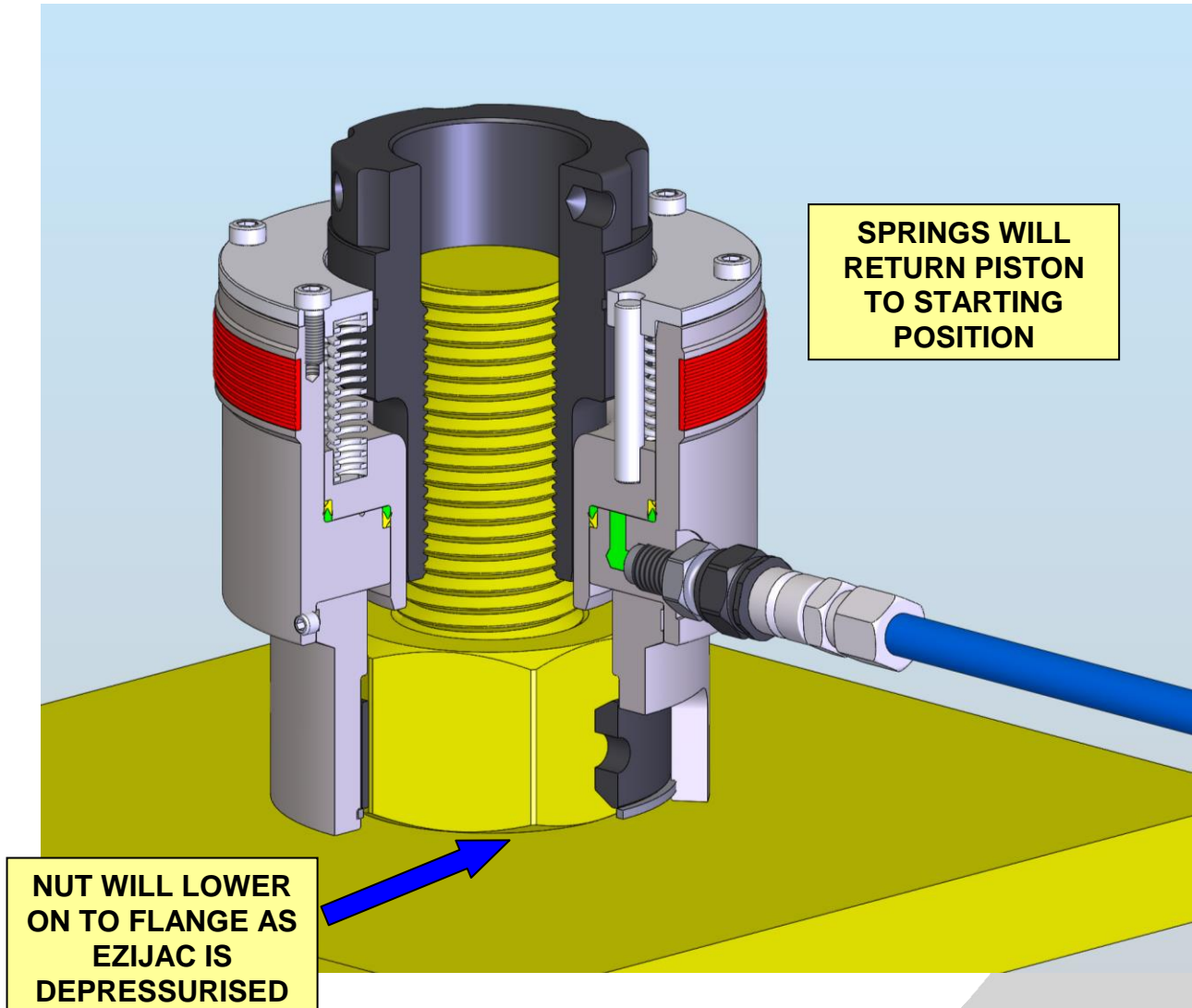


**BACK HEX NUT UP  
BOLT. A GAP MAY  
APPEAR UNDERNEATH  
THE HEX NUT AND THE  
FLANGE**



## STEP 7

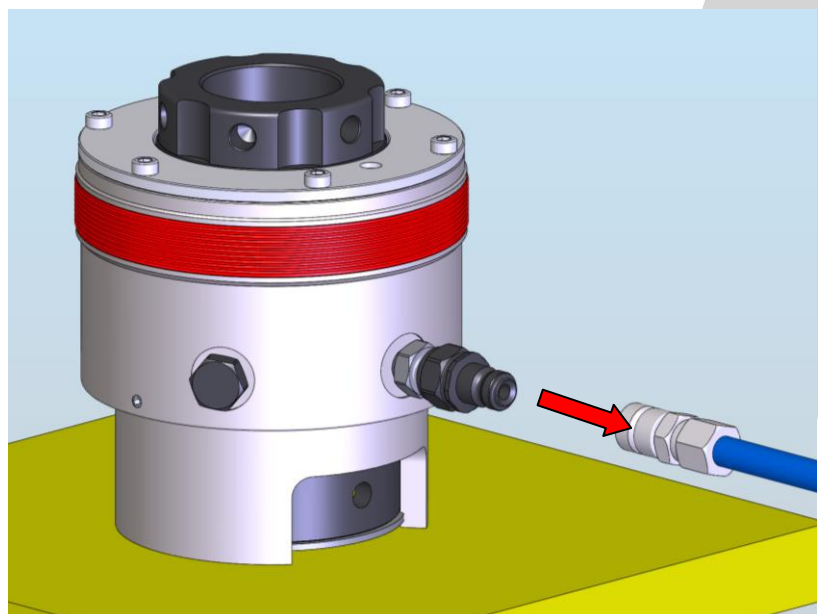
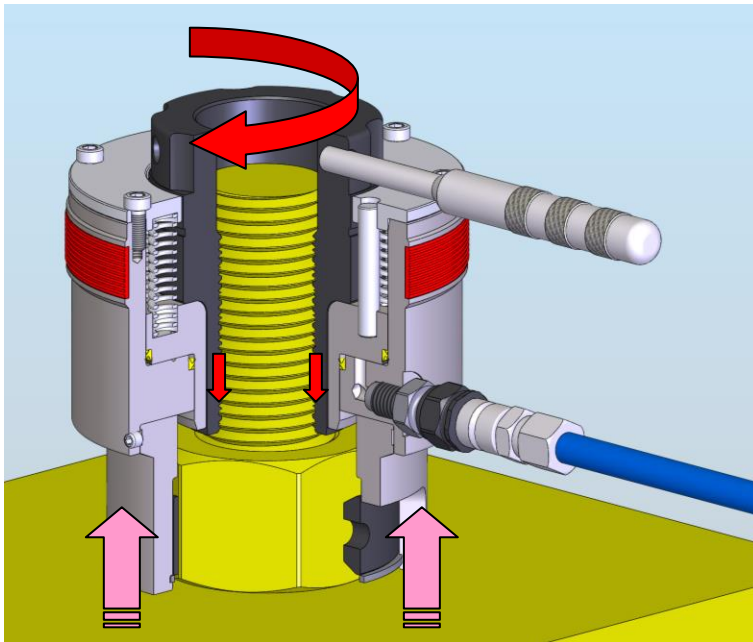
Once the hex nut has been loosened sufficiently remove the pin spanner from the Nut Rotator and begin to slowly depressurise the EziJac. This will transfer the load back onto the hex nut. The return Springs will push the hydraulic fluid from the pressure chamber and return the Piston to its starting position.





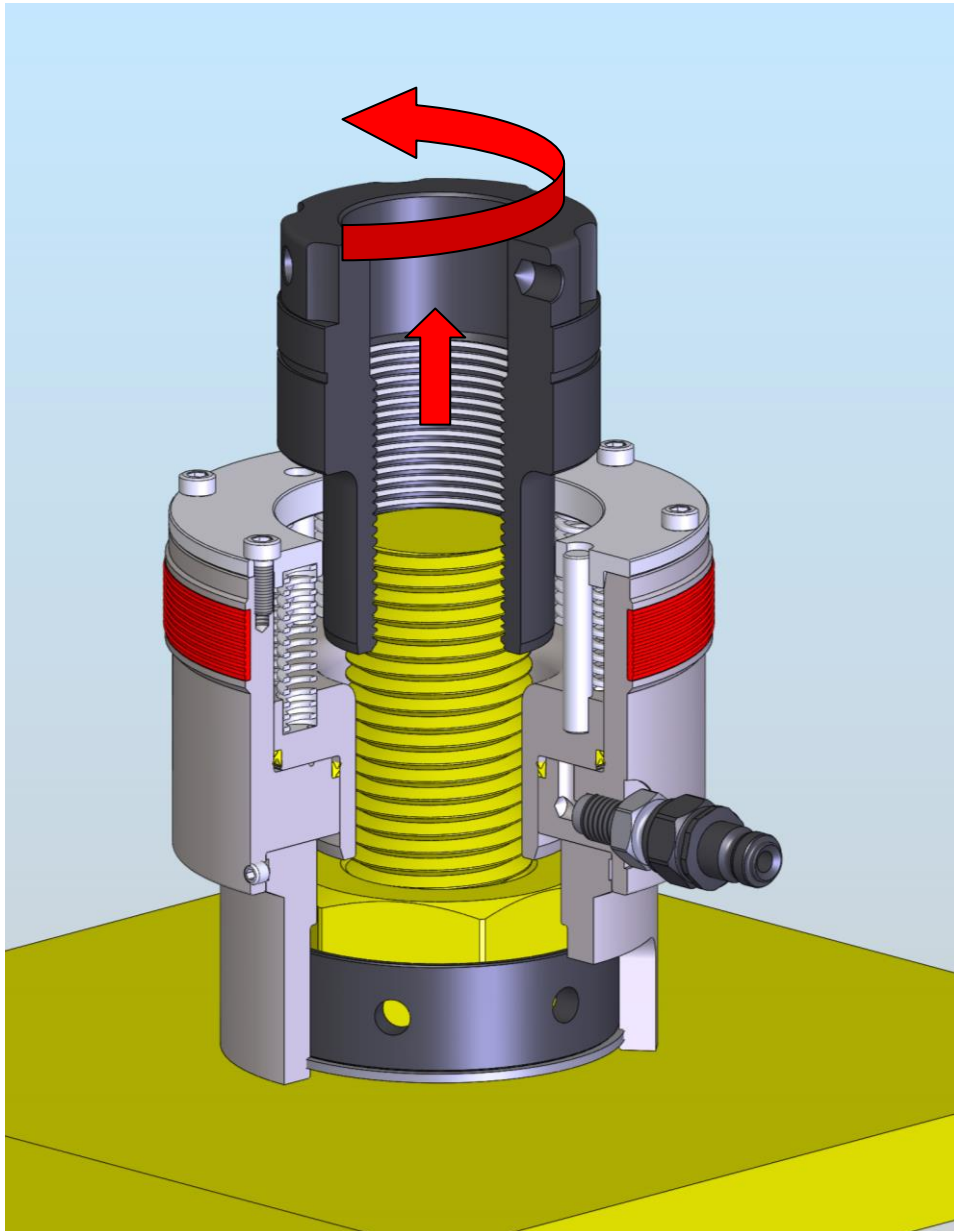
## STEP 8

To ensure the tool is returned fully to its starting position and to release all pressure/load off the tool use the pin spanner to screw the Puller down the stud by turning clockwise until no further downward movement of the Puller is observed. **Ensure the release valve is open on the pump before starting this step.** This step also ensures the puller can rotate freely up and off the bolt, if the tool is not returned correctly in this step the puller will be hard to rotate.



## STEP 9

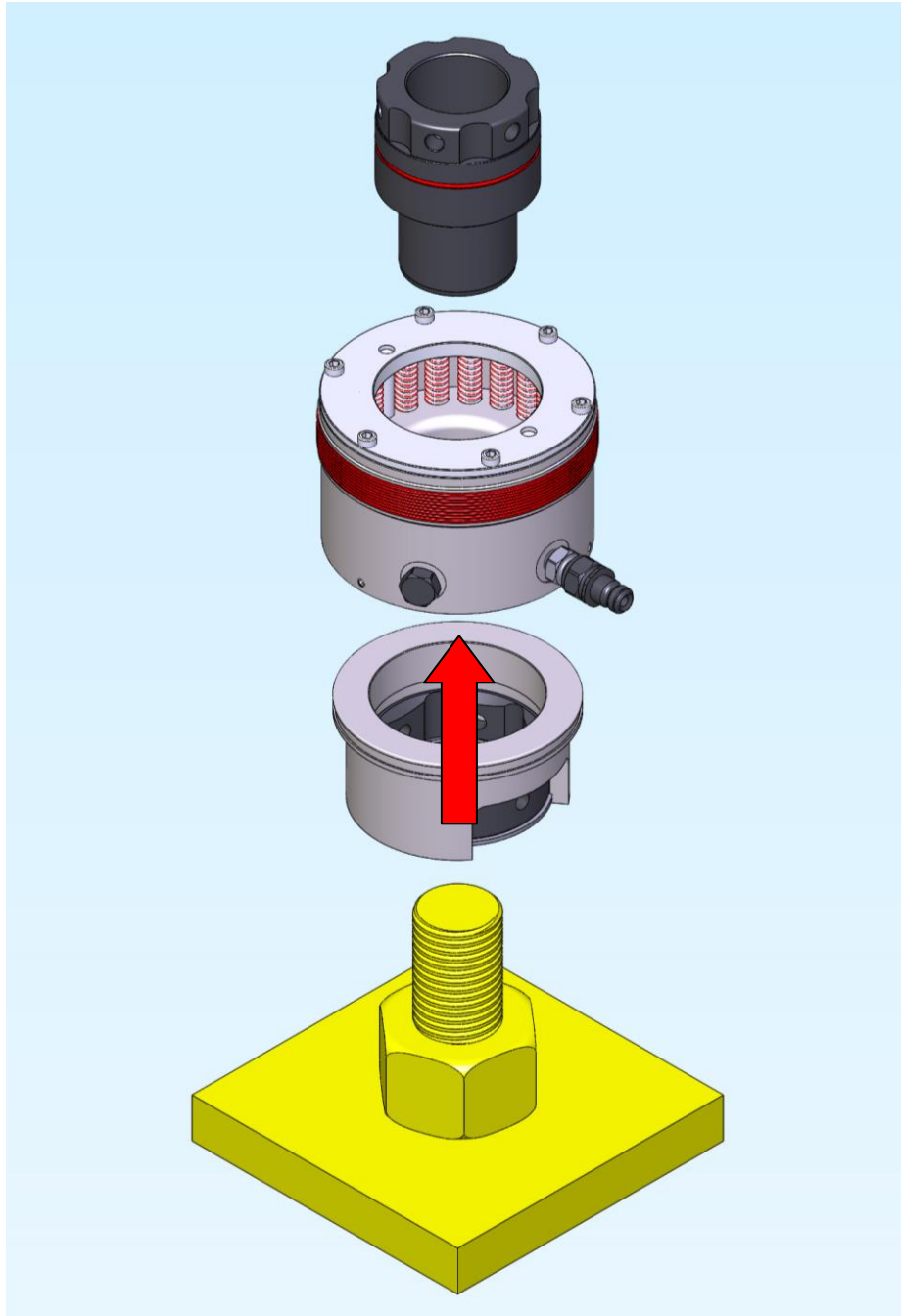
Unwind the Puller by hand, or via use of the Pin Spanner, until it is completely free from the bolt.





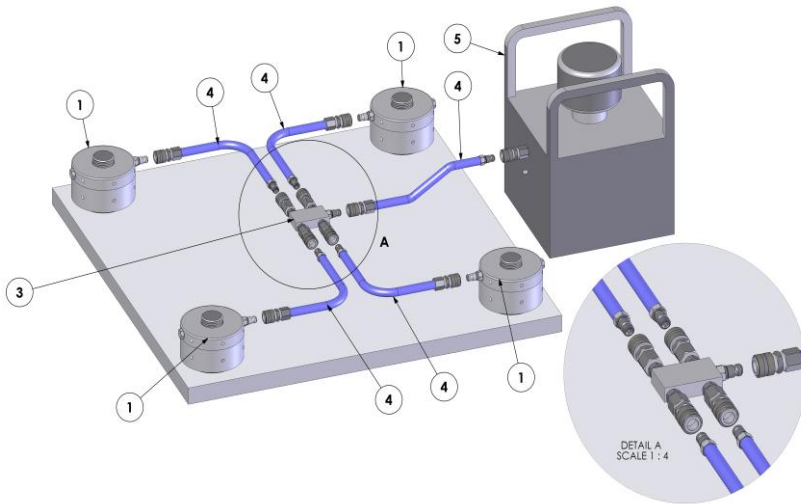
## STEP 10

After completion of the bolt De-tensioning, disconnect the Pump, and remove the **Complete EziJac Assembly**.



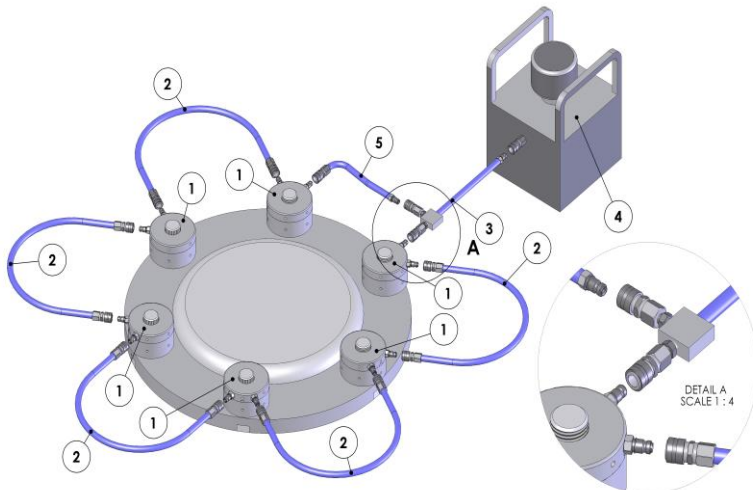
**The de-tensioning procedure is now complete.**

## Standard Circuit Configurations for Tensioning Multiple Bolts Simultaneously



### Manifold Set-Up:

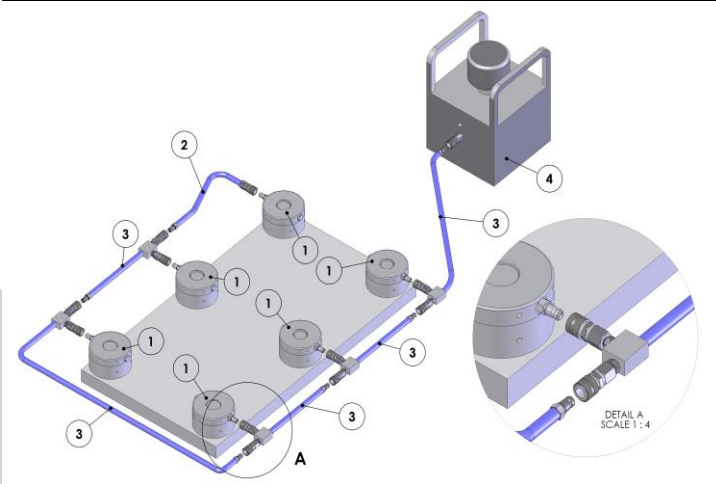
1. EziJac® Hydraulic Tensioners
2. Link Hose c/w Male & Female Fittings
3. 5-Way Manifold Block c/w 4 Female Couplers & 1 Male Nipple
4. Link Hose c/w Male & Female Fittings
5. Pump Unit (Air or Electric)



### Daisy Chain Set-Up:

1. EziJac® Hydraulic Tensioner (with 2 Male Nipples)
2. Interconnect hose
3. T-Blocked hose c/w Male & Female Fittings
4. Pump Unit (Air or Electric)
5. Link Hose c/w Male & Female Fittings

\* **Please Note:** If you are using this layout you will require 2 Male Nipples per Jac. The EziJac Hydraulic Tensioner is only supplied with 1 as standard.



### T-Blocked Set-Up:

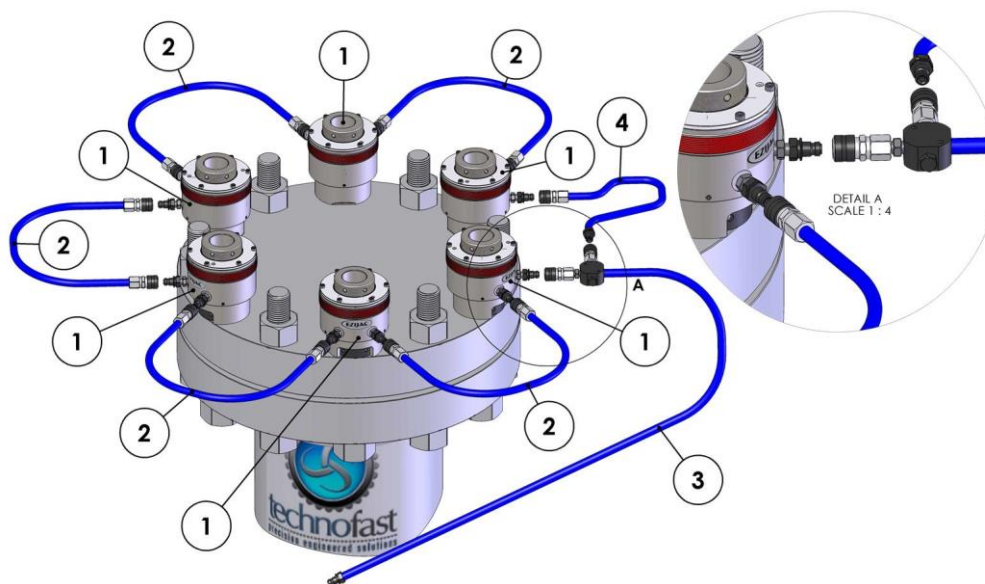
1. EziJac® Hydraulic Tensioner
2. Link Hose c/w Male & Female Fittings
3. T-Blocked Hose c/w Male & Female Fittings
4. Pump Unit (Air or Electric)

## 50% Bolt Tensioning Procedure

This method of assembly is often used where studs can be tensioned from only one side of the joint due to an access restriction on the opposite side. The studs must be assembled with the protrusions on the same side of the joint (see below).

### T-Blocked Set-Up:

1. EziJac® Hydraulic Tensioner
2. Link Hose c/w Male & Female Fittings
3. T-Blocked Hose c/w Male & Female Fittings
4. Pump Unit (Air or Electric)



50% Bolt Tensioning, is most widely used and acceptable method to tension multiple bolts. The 50% Bolt Tensioning method requires sufficient equipment available to fit a bolt tensioner to every alternate fastener around the flange, so as to ensure simultaneous tensioning of 50% of the total quantity of flange fasteners.

Subsequently, moving the equipment to the remaining fasteners, then simultaneously tensions the remaining 50% of the fasteners. It must be ensured that, by using the 50% method, the maximum fastener load for tensioning shall not be exceeded.

It is required to calculate the “first pass” pressure “A” value. This value must be calculated by a qualified engineer with relevant bolting experience. The pressure “A” value would be used to tension the first set of bolts and is typically approx. 20% higher than the pressure “B” value which would be used to tighten the second sets of bolts. The additional load



under pressure "A" would allow for additional load losses which may occur when performing less than 100% coverage tensioning.

To ensure the first 50% of all fasteners have retained residual fastener load, a break-loose test is recommended, after second pass has been completed. Pressure "B" to be used for break loose test.

In the case there is a difference with break loose test pressure; all fasteners on first 50% have to be Tensioned once more to pressure "B".

Similarly, the second 50% of fasteners have to be checked using break-loose test. If there are any difference in the load, then tension all fasteners to Pressure "B" until uniformity of residual load is achieved.

### **Important Note:**

Technofast Industries EziJac range of tools is capable of produce very high bolt stresses and are operated at high pressure. It is therefore extremely important that all staff operating the tools are aware of the correct operating procedures and of health and safety requirements for the use of such equipment.

All personnel operating the equipment must be properly trained in the correct operating procedures for these tools to ensure the safety and wellbeing of personnel. If you require training Technofast will be pleased to offer the correct training course either at our facilities or on site anywhere in the world.

Please ensure that all operators and personnel working with the EziJacs receive a copy of this document and fully understand all of its contents. Do not allow anyone to operate this equipment if they are not experienced with hydraulic bolt tensioning equipment or have not received suitable training.

During the operation of Technofast Industries EziJacs extremely high bolt stresses are produced. If the incorrect bolt material or incorrect installation methods have been used then damage to the subject bolt or the tool may occur. Should a bolt snap under load, then there is a possibility that the reactive force may 'launch' the tool from the application. It is crucial that no personnel are allowed to stand along the axis of the bolt or in close proximity to the tensioner or hydraulic pumping equipment. Failure to do so may result in serious injury.





## Maintenance and Storage

The Technofast EziJac bolt tensioning tool has been designed for optimised reliability and availability, and if used, maintained and stored correctly, will provide trouble free service.

### Storage

The Technofast EziJac is supplied with a tough nitride coating to help prevent rust and corrosion, but it is recommended that following use, the EziJac be inspected, then lightly oiled before storage.

When storing the tool ensure that it has been retracted fully to its starting position and the protective cap is fitted to the hydraulic coupler. The EziJac can then be stored in the upright position in a clean and dry environment. The wooden box the tools were supplied in should offer sufficient protection. Custom designed and fabricated storage containers for EziJac tools and ancillary equipment are available from Technofast for further protection of these valuable assets.

### Maintenance

The Technofast EziJac requires very little onsite maintenance. The only items of the EziJac that should require replacing if the EziJac is used correctly are the hydraulic nipple and the seals. The seals have been design to have a very long life and are not expected to require any attention through out the life of the tool, However if a seal or seals fail to maintain pressure within the tool it may be necessary to replace them. Due to the complexity of the EziJac it is recommended the to tool be returned to the Technofast Head Office for refurbishment and recertification. It is not recommended that the customer perform any maintence to the tool.

In such instances where the EziJac Tensioner has completed the recommended number of cycles noted in the Specifications, or the Tensioner is subjected to excessive stress from overpressurization or operation on an uneven surface, it should be returned to Technofast for inspection and refurbishment.

Technofast Industries recommend that the EziJacs be periodically return to the Technofast manufacturing facility for Refurbishment and Recertification. For more information on this please contact you local Technofast Agent.



## Limited Warranty

Technofast manufactured products are warranted free of original defects in material and workmanship for a period of twelve months from the date of shipment to the first user. This warranty does not include seals nor failures caused by lack of proper maintenance; incompatible fluids; foreign materials in the driving media; in the pumped media, or application of pressures beyond specified ratings. Products believed to be originally defective may be returned, freight prepaid, for the repair and/or replacement to the distributor, authorised service representative, or to the factory. If upon inspection by the factory or authorised service personnel, the problem is found to be originally defective material or workmanship, repair or replacement will be made at no charge for labour or materials. F.O.B. the point of repair or replacement. Any claim for Warranty must be addressed to Technofast, which shall at its' discretion issue an Authority to Return in respect of such goods. This Authority must be received before return shipment and include the following: the original purchase date, purchase order number, model number and other pertinent data to establish a warranty claim, and to expedite the return or replacement to the owner.

Any such warranty is void if;

- the product has been disassembled and reassembled in a facility other than Technofast or a facility suitably and currently qualified by Technofast in conformance with its Quality Standards,
- or,
- the Product has been used continuously as an assembly tool, such as service with an Original Equipment Manufacturer.
- or,
- substitute parts have been used at any time in place of factory manufactured parts
- or,
- the product has been used in any manner not in accordance with the manufacturer's directions.
- or,
- where any modifications not qualified by Technofast in writing have been made to the product

Any modifications to any Technofast product made by any party other than those suitably qualified by Technofast shall be the sole risk and responsibility of that party. Technofast disclaims any and all liability, obligation, or responsibility for the modified product; and for any claims, demands, or causes of action for damage or for personal injuries resulting from the modification and / or use of such a modified Technofast Product.

*TECHNOFAST'S OBLIGATION WITH RESPECT TO ITS PRODUCTS SHALL BE LIMITED TO REPLACEMENT, AND IN NO EVENT SHALL TECHNOFAST BE LIABLE FOR ANY LOSS OR DAMAGE, CONSEQUENTIAL OR SPECIAL, OF WHATEVER KIND OR NATURE, OR ANY OTHER EXPENSE WHICH MAY ARISE IN CONNECTION WITH OR AS A RESULT OF SUCH PRODUCTS OR THE USE OR INCORPORATION THEREOF IN A JOB. THIS WARRANTY IS EXPRESSLY MADE IN LIEU OF ALL OTHER WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. NO EXPRESS WARRANTIES AND NO IMPLIED WARRANTIES WHETHER OF MERCHANT ABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE, OTHER THAN THOSE EXPRESSLY SET FORTH ABOVE, SHALL APPLY TO TECHNOFAST PRODUCTS.*

## Points To Note

The EziJac and all related intellectual property disclosed herewith is covered by Australian and International Patents.

Due to the nature of applications of these fasteners, the manufacturer can accept no responsibility for their performance.

*For technical Advice, please contact your nearest agent.*

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